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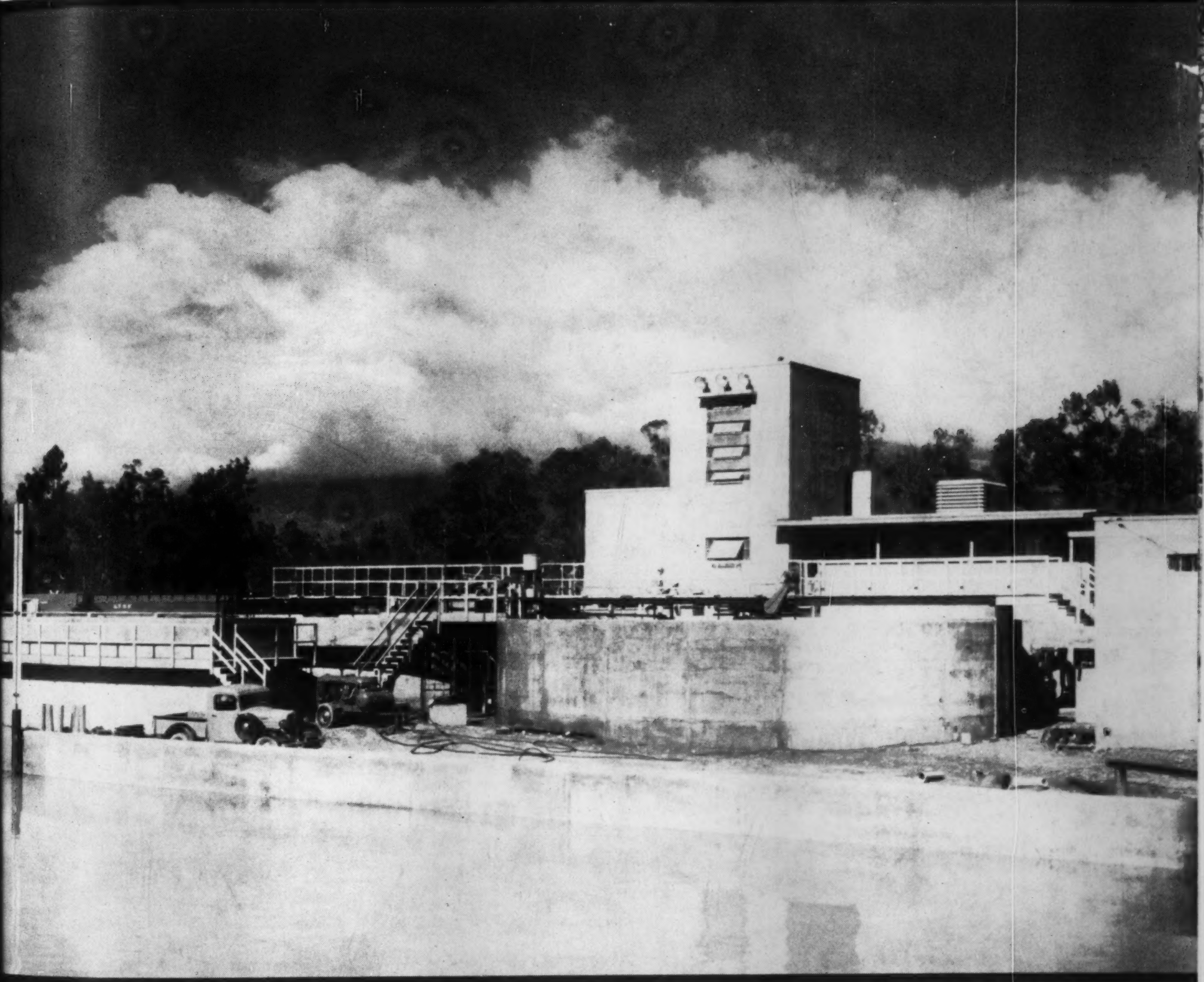

Water Treatment Plant at Fontana, Calif., Steel Mill
Supply Is Softened and Clarified for Reuse (See Article, Page 579)

Volume 13 Number 12

DECEMBER 1943

When the lights go on again

The night when Liberty's torch shines again, the world will be aglow with triumph and jubilance. Even the stars in the heavens will grow dim so Her sparkling rays may reach far out on gleaming waters—to light the way to a better world.

Then, the lights all over the world will go on—for that will be the night Victory has come to America and her Allies. Once out of the darkness, we will see the destruction and ruin of a war-ravaged world. Together, with engineering skill and science, we will speedily lay the foundations for new buildings, piers, bridges, harbors, tunnels, dams and other improvements. We all realize this work must be accomplished quickly . . . for only by removing the horrors of war can all the peoples of the world forget the past and come to a closer understanding of the true meaning of "Liberty and Justice For All."

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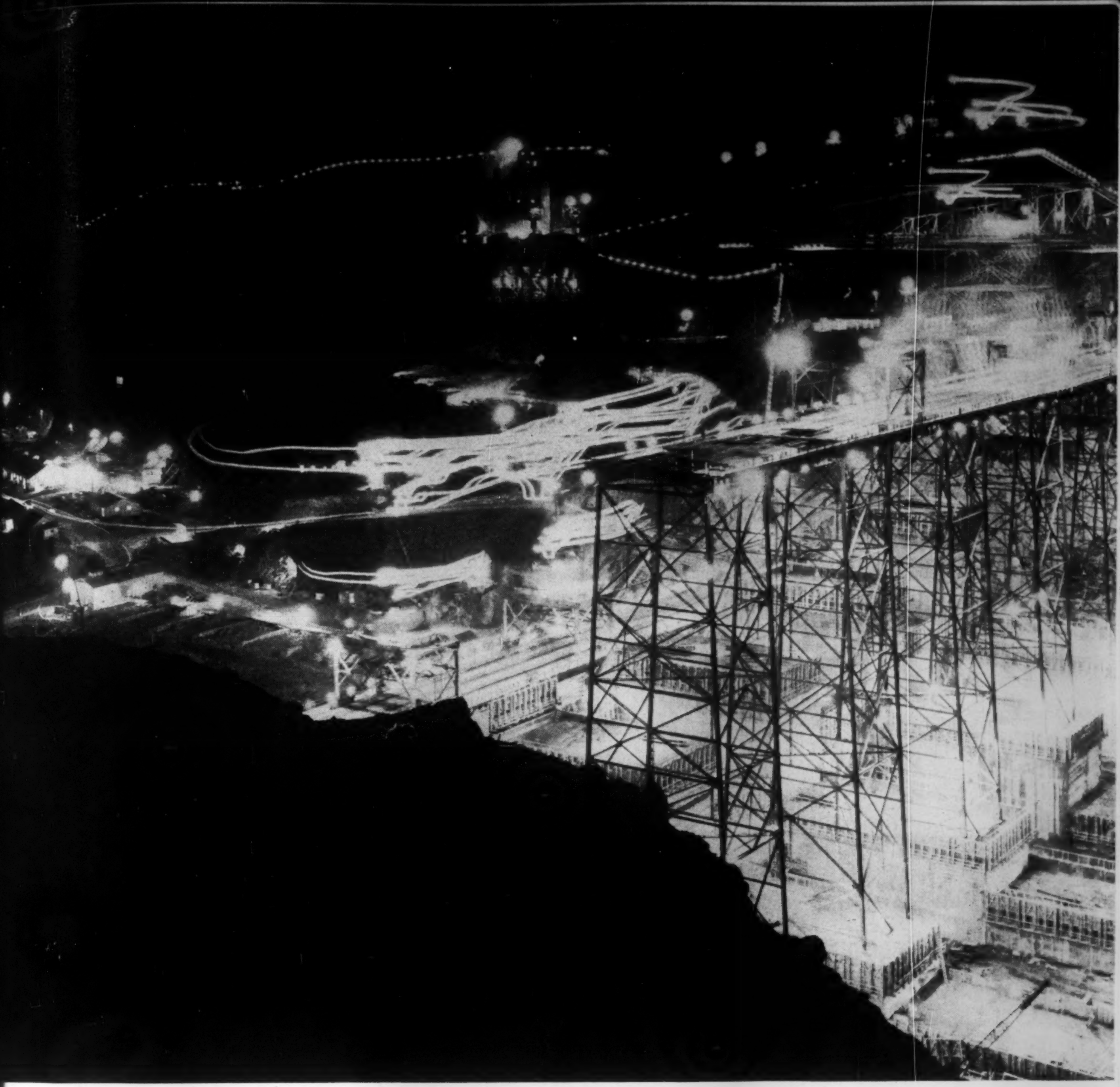
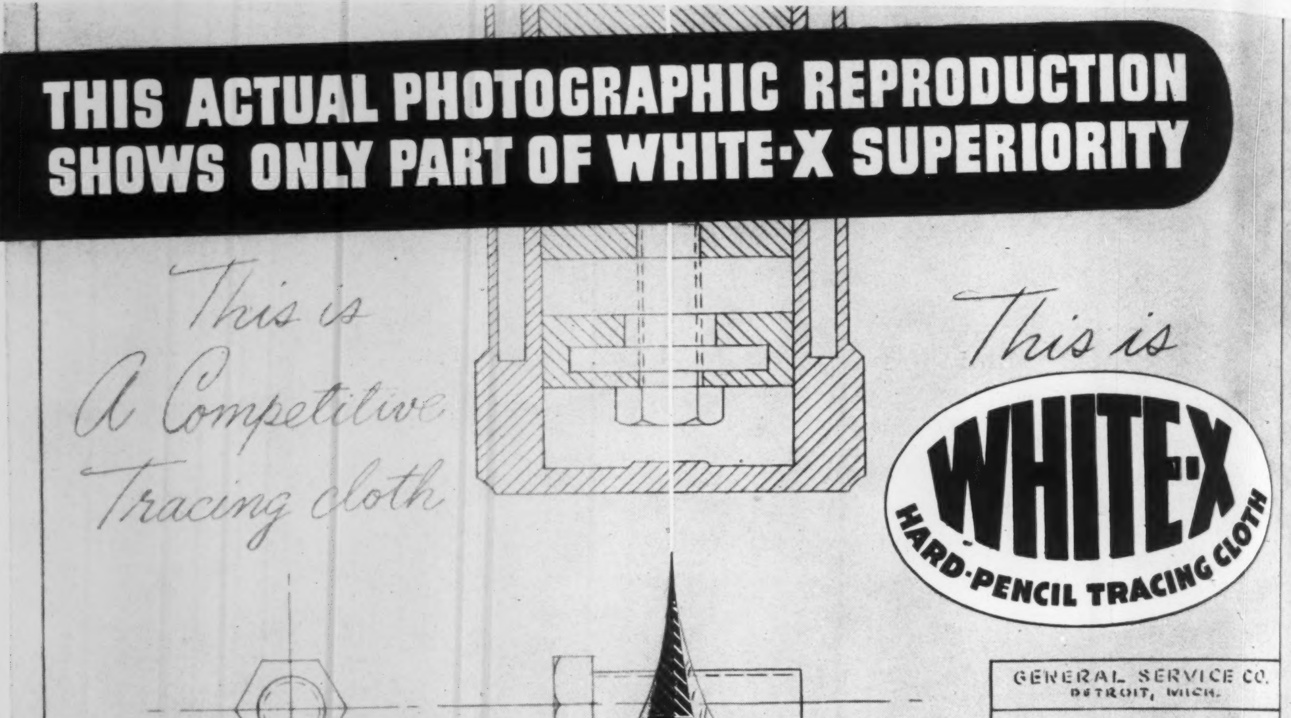


CONSTRUCTION OF FONTANA DAM, TVA, HAS PROGRESSED NIGHT AND DAY

An interesting pattern is traced on this night photograph by lights on equipment. Taken during early stages of the work, it shows some of the first sections of concrete that later enveloped the steel construction trestles. (See article, page 576.)

THIS ACTUAL PHOTOGRAPHIC REPRODUCTION SHOWS ONLY PART OF WHITE-X SUPERIORITY



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Something to Think About

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Planning Now Is Engineering Foresight

Excerpts from Address Before the Lunch Meeting of the Georgia Section, American Society of Civil Engineers, Atlanta, Ga., October 13, 1943

By William N. Carey, M. Am. Soc. C.E.
Colonel, Corps of Engineers; Chief Engineer, Federal Works Agency, Washington, D.C.

STATED briefly, this appeal is simply to reemphasize the importance of the postwar job ahead and the urgent necessity of doing something about it now—not next year or next month, but now.

Learning from History.~It is only in recent months that men have been able to speak out on plans for winning the peace without fear of public criticism on the ground that they were diverting attention from the necessity of first defeating our enemies. In increasing numbers, people now are beginning to recognize a grave probability of large-scale unemployment during the immediate postwar period unless plans are made at once to prevent it.

It is of interest to look back to the end of the last war. Records show that a few people anticipated the unemployment which was certain to follow the end of World War I but that they failed to accomplish anything effective to guard against it. Most of the agitation occurred in September and October of 1918, although the war then was more than four years old. Then, as now, many recognized the necessity of preparing for postwar eventualities, but likewise they assumed there was plenty of time.

Profiting from the Last Failure.~So this do-nothing policy prevailed to our later bitter sorrow. The gratitude of the nation was officially expressed to its soldiers, sailors, and marines on their honorable discharge from war duty. Each was given a coach ticket home and sixty dollars. From there on, so far as Congress was concerned, every man was on his own.

If the improbable should occur and this war should come to an early, sudden end, we would find ourselves in about this same position. Great as were the unemployment and confusion that followed a do-nothing policy after the last war, that period will be remembered as a pleasant interlude in our history compared to the chaos that would attend a laissez-faire attitude after this war.

Public Works to Supplement Private.~Fortunately, the belief that private business alone will be capable of carrying the postwar employment load is not general. Level-headed leaders in every state in the Union, as well as in Washington, agree that needed public works must be made ready to absorb those postwar employables who cannot find work immediately in industry or agriculture. This is one proposal in which partisan politics disappears, in which the Chamber of Commerce of the United States joins hands with the President.

There are increasing signs that the nation will not again be caught sound asleep on the postwar employment problem. Members of Congress appear far more aware of the dangers inherent in a do-nothing policy than were their predecessors of a quarter of a century ago.

Some Present Trends.~One measure, now law, appropriates $50,000,000 to the Public Roads, Administration of the Federal Works Agency for highway planning. This supplements a previous appropriation of $10,000,000 for the same purpose, making $60,000,000 in federal funds available. Since this is to be distributed among state highway departments on a federal-state matching basis, $120,000,000 can be used altogether; and it is being used, to advance road construction planning to the point where contractors can take over immediately after the war. A highway program to cost several billion dollars should result.

The Society also has done and is doing valuable work in the field of postwar public works. Members are familiar with the excellent statement on postwar construction adopted by the Board of Direction at its meeting in Los Angeles last July.

It would be easy to assemble a hundred recent quotations from prominent citizens, local and national, and of all shades of political thinking, to show that they are awake to the real need for detailed plans now for postwar work. A large program of public works "ready for a quick start" cannot be developed with a simple turn of the wrist, or even solely by appropriations of money. Much time and much effort must also be expended. Events of the past decade are still fresh in the minds of every American—the attempts of PWA, of CWA and finally of WPA, to provide jobs quickly. It took a second war, with its resultant manpower shortage, to clear the air.

Consider These Axioms.~Most citizens will doubtless agree upon the following general principles:

That government, both federal and local, has an obligation to help close the gap when private initiative cannot provide all the jobs necessary to maintain full employment;

That the most useful jobs government can furnish are in the construction of soundly conceived public works which add to the nation's wealth and promote its general welfare and convenience;

That worth-while public works require months for advance preparation—for engineering surveys, preparation of plans and specifications, and acquisition of land;

That doles are enervating, that they undermine self-confidence, and that no honest man wants a dole as a substitute for a useful job at decent wages;

That improvised relief projects are useful in sustaining life, but seldom add much to permanent material wealth.

Specific Activities Essential.~No thinking person believes for a moment that all we have to do to banish the specter of postwar unemployment is to develop a big private and public construction program. Many related problems must be met and solved—demobilization of the armed forces, industrial training for many returning soldiers and sailors, rehabilitation of the wounded, transfer of government-owned plants to private ownership, social security, and unemployment insurance.

Just what do we mean when we say that we must prepare a public works program? The preliminary work to be done on each individual project, and completed before the end of the war, includes these three basic activities:

1. Preparation of working plans, specifications, contract documents and estimates of construction costs.
2. Selection of rights of way and other necessary rights, determination of their costs, and preparations for prompt acquisition.
3. Completion of legal and financial arrangements for immediate construction.

Why Wait for Congress?~True, a few states and cities are now tackling these preliminaries with intelligence and courage. Too many others are content to speculate, to develop only project outlines rather than plans and specifications. Some of these excuse their inactivity by saying, "Let us wait until Congress acts on this matter."

Of course, it is important that the people know at once what federal help, if any, may be offered for the accomplishment of the necessary preliminaries to a public works program. But that is a poor excuse for any live community to delay making definite plans now for the improvements it badly needs.

Insurance Is Cheap, but Valuable.~The cost of real plans for a project is only about three to six per cent of the construction cost. Even though the construction be long postponed, there can be no cheaper insurance against unemployment. And the time to obtain that insurance is now, before the tidal wave of postwar employables looking for jobs engulfs us.

No one knows what Congress may do. If federal aid in planning is forthcoming, it may well be that it would provide for a loan only, to be returned when construction was authorized. Any federal-aid legislation is certain to impose conditions and limitations to which the borrower must conform. Because of all the uncertainties in the possibility of federal aid, and because of the urgency of getting public works plans under way now, it would seem that the argument is all on the side of not waiting for problematical federal action.

A National Viewpoint.~When we do develop such a program, reason dictates that it should be national in scope and control. It must be, so that it can be integrated into local, regional, and national needs and be capable of management in such a way as to complement the reconstruction efforts of private business. Then the valve could be turned on in areas where private industry cannot provide all the jobs needed; or can be shut off where private industry alone can absorb the unemployed. For example, it would be most uneconomic to prosecute with vigor public works projects in Detroit at a time when they would add little to business recovery but would come into competition with private industry for men and materials. In such case it might be desirable to slow down or defer public works in Detroit and speed them up in Atlanta or Jacksonville.

Advocacy of a program national in scope should not carry the false connotation that states and municipalities should hold up planning now pending action by Congress. It is the construction of public works projects in the postwar period that will need national control, not their planning now. It is only through national control of a large reservoir of public works projects that public works can be held in their proper place, that is complementary to private enterprise and not in competition with business and agriculture for available manpower and materials.

Local Planning Immediately.~A reservoir of public works projects cannot be brought into existence unless states and cities and villages develop their plans for needed public works so that each planned project may help fill the reservoir. For maximum success, this public works program must have its origin among the "grass roots" of the nation. Apathy on the part of local subdivisions of government now may force the national government later to hand out from the federal cookie jar some hastily conceived, emergency, made-work program. We should know by this time that such a program is certain to be wasteful of our money as well as noncontributive to permanent national prosperity.

The glorious successes of our military forces daily brings closer the day when peace again will dawn upon a war-torn world. From our present dislocated local and national economy we must bring forth a peacetime economy in which there will be no place for large-scale unemployment.

Public works can carry but part of the future employment load, but unless we get them ready now we will not be prepared to use them as an employment stabilizer. For the development of a postwar public works program, energetic cooperation is needed—cooperation of professional, civic, business, and labor organizations and of the legislative and executive branches of federal, state and local governments. To preserve the economic freedom characteristic of the American way of life, the preliminary work must be done now. It will be too late if we wait until the war is over.

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Railroads Establish Operation Records

A Report on the Wartime Performance of Our United States Carriers

By C. S. DUNCAN

ECONOMIST AND DIRECTOR OF COMPETITIVE TRANSPORTATION RESEARCH, ASSOCIATION OF AMERICAN RAILROADS, WASHINGTON, D.C.

IN 1939 confirmed pessimists of the press forecast an early breakdown in rail transportation service due to the enormous increase of wartime traffic. Even those who had faith in the ability of the rail carriers to meet the emergency envisioned vast increases in rolling stock, terminal facilities, and costs. Fortunately, however, both types of prognosticators have been proved hasty in their judgments. In three years revenue miles more than doubled while the rolling stock actually decreased. Many other comparisons are brought out in Dr. Duncan's factual report, presented before the Engineering Economics Division of the Society at its Los Angeles Convention.

MUCH has been written in past months about this industry "converted to war work" or that one "retooled to manufacture war products." Although the tasks of the railroads expanded enormously with wartime demands, they enjoyed one important advantage—no conversion or retooling was necessary. The function of the railways in carrying freight and passengers was not changed. While the motive for the movements may be different, transportation in war is essentially the same as that in peace.

There are, however, vital differences in the character of traffic movements which are not brought out by cold figures, or comparative graphs. In normal times traffic flows in the great channels of established trade, the changes coming gradually, the shifts foreseen so as to be amply provided for. War demands are often sudden, unusual, exacting. They may have nothing to do with established channels of trade which the railroad plant was developed to serve. There are two significant results—a need for flexibility of service, and a voracious demand for equipment. Yet both the civilian and the military requirements must be met at one and the same time.

Here are a few examples of wartime demands. They are merely illustrative, for the number is great.

1. There has been repeated reference to the problem of oil transport to supply the seventeen eastern states. Formerly this traffic moved 95% by water tanker. The tankers were withdrawn and railroads were asked to substitute. They promised 200,000 bbl a day. The peak of this movement to date is nearly 1,100,000 bbl. This has required over 71,000 tank cars for an unusual, abnormal, and wartime demand. It has absorbed the services of 1,500 locomotives.

2. Another unusual movement by rail is the hauling of coal to New England. Much of this formerly came by coal barge up the coast. These barge operations were almost wholly suspended, and the railroads had to fill the breach. Their traffic was increased by about 3.5 million tons.

3. With the withdrawal of commercial vessels from the Atlantic coastal trade, raw sugar from the Gulf coast was loaded on the rails to be hauled to the eastern refiners. This movement is substantial.

4. Traffic through the Panama Canal ceased. Here, too, the rails were asked to substitute. This means approximately 7.7 million tons of freight—a long-haul business, estimated to require the continued service of from 17,500 to 25,000 cars with the corresponding locomotive power.

5. There are many new war plants and establishments in the South and Southwest. Movement of materials for their construction, equipment, and continued operation constitutes a new demand for service. Four thousand carloads a day are hauled to the numerous military establishments in this area. Here is another great drain on power and car capacity.

6. Troop movements by rail aggregate over two million per month. The average haul is 800 miles as compared with 120 for the average passenger carried in

Norfolk and Western Ry.

LOADED COAL CARS AWAITING SHIPMENT FROM WEST VIRGINIA MINES

U.S. Army Signal Corps

WAR MATERIALS ARE TRAVELING THE RAILS IN AN EVER INCREASING STREAM

peacetime. This military traffic is about 20% of the total.

7. The average haul by rail of military freight traffic to the Pacific, the Gulf, and the Atlantic ports is 700 miles. For the country's freight traffic as a whole the average is about 450 miles. The effect of these unusually long movements is felt not only on locomotives and cars but also in the terminals and yards, and in the interchange of traffic between railroads, which has increased by 20%. Empty car movements on transcontinental hauls have been just reversed.

8. As to civilian passenger traffic, the shortage of gasoline and rubber has cut down the use of private automobiles. Many people are not running about so much. Many go by bus. The rails get many. Thus an increased civilian passenger traffic is added to the military, naval, and marine needs, making for a further demand upon locomotives and cars.

TABLE I. COMPARATIVE PRE-WAR AND WARTIME DATA ON RAILROAD EQUIPMENT AND PERSONNEL

ITEM	1939	1942	% OF CHANGE
Mileage operated:			
Road	233,277	229,787	−1.5
Track	391,435	384,725	−1.5
Employees:			
Number	987,675	1,271,077	+28.7
Total compensation	$1,863,333,736	$2,932,225,220	+57.4
Total annual compensation	$1,868	$2,307	+22.3
Average hourly compensation (cents)	74.9	85.2	+13.8
ITEM	1939 (OCT. 1)	1943 (JUNE 1)	% OF CHANGE
Locomotives (number):			
Owned	42,778	41,693	−2.5
Serviceable	34,601	39,589	+14.4
Freight-carrying cars (number):			
Owned	1,643,898	1,739,934	+5.8
Serviceable	1,449,008	1,691,793	+16.8
Passenger-carrying cars, including Pullmans:			
Number	28,620	28,478	−0.5

For purposes of comparison and contrast, a simple table has been set up (Table I) containing comparative data for 1939 and 1942 (or 1943 as far as available). The former represents a year before the war, and the latter reflects wartime developments.

It will be noted that the essential plant, the tracks upon which the volume of traffic runs, has not expanded, but on the contrary has actually contracted. This is the result of the abandonment of numerous branch lines and in the aggregate represents a net loss of 6,710 miles.

There has been also an actual decrease in the total number of locomotives of 1,085, or 2.5% from 1939 to June 1943. In the latter year, however, there were fewer idle ones in the shop awaiting repairs. Serviceable locomotives were greater in number in June 1943 by 4,988, or 14.4%. As of October 1, 1939, the number of unserviceable locomotives was 8,177 or 19.1%. On June 1, 1943, this number had decreased to 2,104, or 5.0%. Here is the first evidence of a more complete utilization of equipment, which is good railroading as it is good operation in any business. The figures do not show another change—the scrapping of the old and the increased efficiency of the new—also taking place.

The number of freight cars increased in the period by 96,036, or 5.8%. Like the locomotives, fewer cars were in shops idle and awaiting repairs. On October 1, 1939, the number of unserviceable freight cars was 194,890, or 11.9%. On June 1, 1943, the number was 48,141 or 2.8%. Serviceable freight cars, in June 1943, were greater in number by 242,785, or 16.8%. The figures on freight cars tell the same story as those for locomotives.

In contrast with freight cars, passenger cars showed a decrease of 142 or 0.5%. This fact should be kept in mind when the great increase in passenger traffic is discussed. The handling of this enormous increase is one of the most remarkable things that has happened.

In the transition from peace to war, railroads called into their service 283,402 additional employees, or an

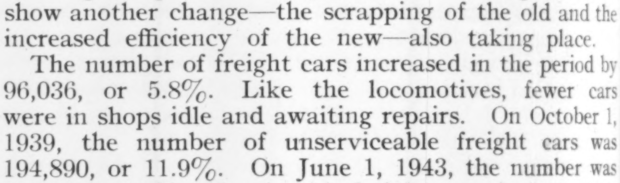


FIG. 1. REVENUE TRAFFIC OF THE RAILROADS—PERCENTAGE INCREASE OF 1942 OVER 1939

increase of 28.7%. Their compensation increased by $1,068,891,484, or 57.4%. Here indeed is additional purchasing power. As Table I shows, their average annual earnings and the average hourly earnings also increased substantially.

OPERATING DATA

With this plant and with these employees, what work has been done as we changed from a peace economy to a war economy? As simple units of measurement let us examine three items—car loadings, revenue ton miles, and revenue passenger miles (Fig. 1, Table II). While this is not the whole situation by any means, it is enough for a general understanding of conditions.

Car loadings increased by 8,907,241 carloads, a substantial amount. Observe, however, the next figure—revenue ton miles—which increased by 304,631,000,000, or by 91.4%. Even more remarkable are the figures on revenue passenger miles, which show an increase of more than 31 billions. This record was achieved, as was noted, actually with fewer cars.

How have the railroads been able to carry this great burden of transportation and to merit the laudatory comments of shippers of civilian goods, of the Army and Navy, and of government bodies? Primarily the success has been due to the management and skill of the men employed. They have demonstrated beyond any peradventure of doubt the flexibility, the dependability, and the expandability of railroad service. As statistical evidence, data are offered on gross and net ton miles per train hour, locomotive performance in freight and passenger service, freight car performance, train speed, and average load per train and car (Table II, Fig. 2).

The increase in the gross ton miles per train hour of 2,702 tons, or 8.2%, and in the net ton miles of 2,685, or 20%, is evidence of better operation and better loading. The increases of 17.7% in freight locomotive performance and of 12.3% in passenger locomotive performance mean that more service is being obtained from the "old iron horse" in carrying goods and persons. This is due to improved operation. Freight engines went 18.4 miles further per day, passenger engines 22.6 miles further.

The freight car in 1942 moved with greater celerity than in 1939. It went 9 miles further per day. When that figure is multiplied by the total number of cars moving, the result is significant. The 1942 rate is equal to an additional 381,000 cars at the 1939 rate.

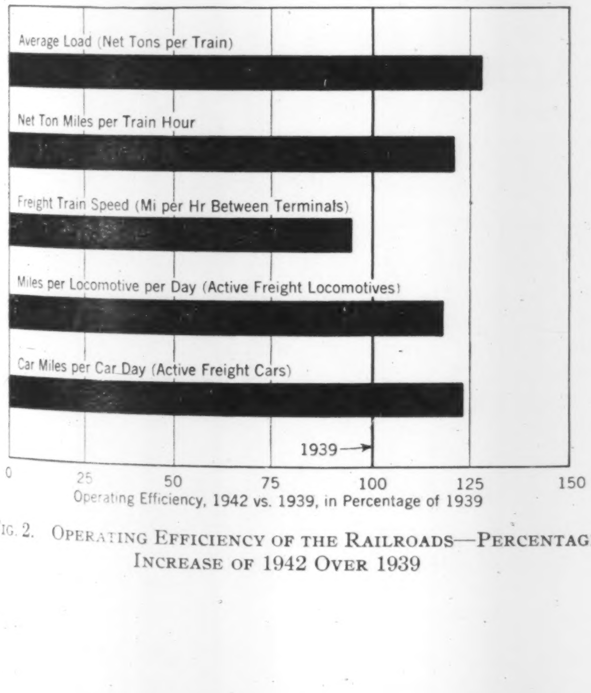


Fig. 2. Operating Efficiency of the Railroads—Percentage Increase of 1942 Over 1939

Pennsylvania RR.

A Full Train of Oil Tank Cars en Route to the East Coast

Since 1939 the speed of freight trains has decreased slightly. This is despite the fact that solid oil tank trains to the East Coast run on fast schedules. Passenger train schedules remained about the same. Thus there has been no gain in the matter of speed.

Table II. Comparative Pre-war and Wartime Data on Railroad Operation

Item	1939	1942	% of Change
Car loadings	33,911,498	42,818,739	+26.3
Revenue mileage (thousands):			
Ton miles	333,438,412	638,069,444	+91.4
Passenger miles	22,651,334	53,675,562	+137.0
Ton miles per train hour:			
Gross	32,808	35,510	+ 8.2
Net	13,450	16,135	+20.0
Locomotive performance (miles per locomotive per day):			
Freight	104.0	122.4	+17.7
Passenger	184.2	206.8	+12.3
Freight-car performance (car miles per car day):			
Active cars	41.3	50.6	+22.5
Train speed (mph between terminals):			
Freight	16.7	15.8	− 5.4
Passenger	36.9	36.9	0
Average load (net tons):			
Per train	813	1,035	+27.3
Per car	26.9	31.8	+18.2

Most significant are the figures in respect to average load. Cars were loaded more heavily in 1942 by 4.9 tons. Trains were heavier by 222 tons. It appears, therefore, that car loadings are no longer an accurate criterion for calculating comparative business done. It should be pointed out that here lies one essential reason why, with an increase in car loadings between 1939 and 1942 of only 26.3%, ton miles increased by 91.4% in the same period.

In 1939 there were many gloomy minded prophets in the land forecasting an early breakdown in rail transportation service. The government, they said, would have to take over the rail carriers as it did in the last war. They have been wrong so far. Excellence of performance indicates their continued error. One reason for their mistake lies in the fact that certain very simple but fundamental lessons were learned from the last war.

New York Central RR.

IRONCLAD "LAND CRUISERS" ON THEIR WAY TO THE FIGHTING FRONTS

For example, freight cars are built to move. They are a traveling warehouse, not a stationary one. They can contain and protect goods in a yard, but they can perform transportation service, their true function, only when they move. A car is not loaded until provision has been made for its unloading. In this way congestion is saved, and better use of equipment is realized.

A second lesson learned from the last war is organization by the carriers, by the government, and by shippers and receivers of freight. The Army, the Navy, the Maritime Commission, Lend-Lease, W.P.B., Civilian Supply, all have their transportation sections. There are the general Office of Defense Transportation and the Bureau of Service, Interstate Commerce Commission. The rail carriers have a Car Service Division, with a national organization and a Division of Operation in the Association of American Railroads, together with a representative in each port and a representative working with the Transport Division of the Army. Shippers and receivers of freight have advisory boards covering the entire country, with vigilance committees to touch up laggards who holds cars too long and committees to deal with the grain movement and all the other problems that arise. All these organizations were ready and working or were planned when the war came.

Organization is an empty shell without thoroughgoing cooperation. There is such cooperation in rail transportation to a successful degree. Without it we would be working at cross purposes and there would be hopeless confusion. Thus cooperation is the real secret of the rail transportation miracle.

A word about the effect of the volume of traffic on the railroads. They are handling the greatest traffic movement in their history. A few years ago it was at a very low ebb. This increase has dramatically demonstrated that volume is the predominant factor in most of the efficiency curves in railroad operation. There is an upward spiral of returns as volume increases, just as there is a downward spiral as volume declines.

Volume of traffic is, of course, not the sole factor to account for the differences between 1939 and 1942, or between peace and war. In the last quarter of 1941 substantial increases in wages were granted to railroad employees. In the first quarter of 1942 rate and fare increases were granted by the Commission to offset in part the increase in wages and were removed May 15, 1943. The wage rates remained and higher ones are being sought, but the increased demand on car capacity undoubtedly made possible the thoroughgoing cooperation between shippers and receivers of freight and the railroads. The length of haul is also a factor. Nevertheless, in view of all these various elements, it is interesting to note what has occurred with greatly increased volume of traffic.

As shown in Table III, the average receipts per ton mile were substantially lower in 1942 than in 1939, but in spite of this decline in average receipts per ton mile, operating revenues were 86.9% higher. By and large, this is the effect of increased volume of traffic. Furthermore, these results appear even though the government is the largest shipper in the country and much of its traffic moves on land-grant rates—one-half the commercial rate. The amount of such reductions was estimated at more than $20,000,000 per month in the fall of 1942, or about $250,000,000 a year. It is even greater today.

With added employees, increased wages, more overtime, higher prices for materials and supplies, and increased volume of business, the operating expenses were greater by 57.7%. In the face of this increase, the ratio of expenses to revenues, or the so-called operating ratio, declined from 73.05% in 1939 to 61.63% in 1942. This is the general index of operating efficiency. It is a ratio that never should rise above 70%. The effect which volume of traffic has on this index is evident.

TABLE III. RAILROAD INCOME AND DISBURSEMENTS

ITEM	1939	1942
Average receipts per ton mile	0.973 cent	0.932 cent
Operating revenues	$3,995,004,000	$7,466,227,000
Operating expenses	$2,918,210,000	$4,601,430,000
Operating ratio	73.05%	61.63%
Tax accruals	$355,678,000	$1,202,443,000
Net railway operating income	$588,829,083	$1,480,941,000

Tax accruals in 1942 increased by 238.1% over 1939. This includes all kinds of taxes—payroll, property, and income.

Even though operating expenses and taxes increased, and average receipts per ton mile decreased, yet the increased volume of traffic rapidly raised the net railway operating income. The increase in this income between 1939 and 1942 was $892,111,917, or 151%. While these figures seem large, it is well to point out that the return on investment in Class I railroads in 1939 was only 2.25%. In 1942 it had risen only to 5.50%, which is certainly not an exhorbitant return.

There could not be a clearer demonstration than these figures that the railroad industry depends upon volume of traffic. It is an industry of increasing returns up to the limits of its capacity, which even yet have not been defined. There is no other transportation agency that can match it in this respect. Cheap transportation is mass transportation by railroad. The achievements of the American railroads in wartime are amazing and have been called a modern miracle. To do the job there was, of course, in the industry the potential capacity, flexibility, dependability, and expandability which the emergency has enabled this generation to witness.

Preventing Failure of Timber Joints

By CHARLES MACKINTOSH

MACKINTOSH AND MACKINTOSH, CONSULTING ENGINEERS, LOS ANGELES, CALIF.

THERE has been a large increase in the use of timber during the period of expanded building activity caused by the war. Many designers who are unfamiliar with the non-homogeneous properties of wood are now designing large timber structures, and it is therefore not surprising that failures have occurred. Particularly, tension-across-grain dangers are discussed by Mr. Mackintosh. Both character of failures and their principal causes are given, as well as suggestions for their cure.

DURING the last twenty years there have been many tests on joints using nails, screws, and bolts. Engineers have become fairly well acquainted with these commonly used joints; however, during the more recent increase in building activity, a large number of new-type timber connectors have been used. As yet there have not been adequate tests to determine the weaknesses of the many types of joints in which these new connectors may be used.

Engineers have recognized the problem of determining the direction of the shearing stress to be transferred by each connector ("Angle of Load to Grain for Timber Connectors," by M. S. Ketchum, CIVIL ENGINEERING, May 1943), but have seldom analyzed the critical nature of the stresses within the timbers at the joint. The difference between the direction of the member and the direction of shear to be transmitted by an attached split-ring connector is, of course, the angle-to-grain at which the ring is bearing on the timber.

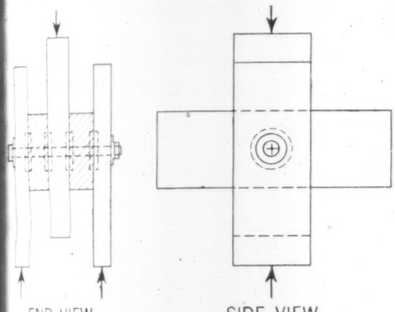


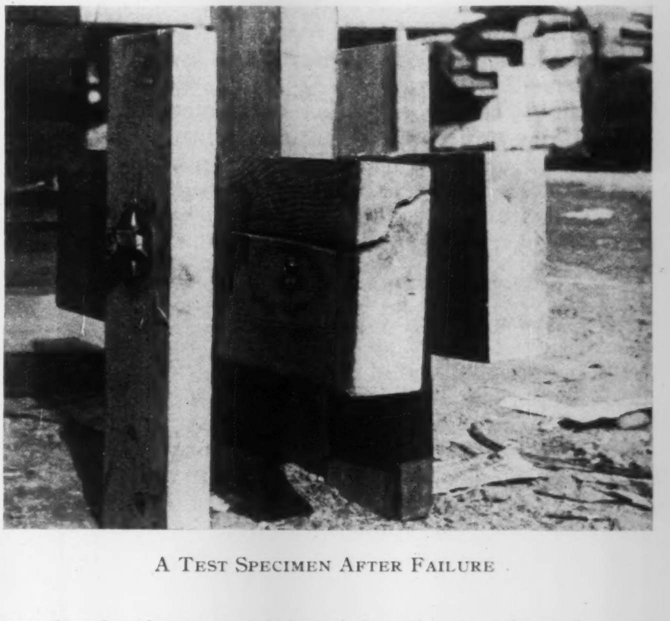
FIG. 1. TIMBER JOINT UNDER TEST TO DETERMINE STRENGTH

In symmetrical five-member joints, such as those here illustrated, the members that lie between a center member and an outside member have severe internal stresses because they must transfer forces normal to their axes from one face to the other in addition to the usual forces parallel to their axes. The transfer of such normal-to-grain forces through these intervening members often produces large tension-across-grain stresses, which cause these members to split at the joint.

Consider first the test specimen shown in Fig. 1. A single $^3/_4$-in. bolt with 4-in. round split-ring connectors and malleable washers was used, and the bolt was tightened with a wrench, then loosened and tightened with the fingers so that the joint was snug but without any tension in the bolt. This joint was then placed in a standard testing machine and a vertical load was applied downward on the center member and upward on the side members.

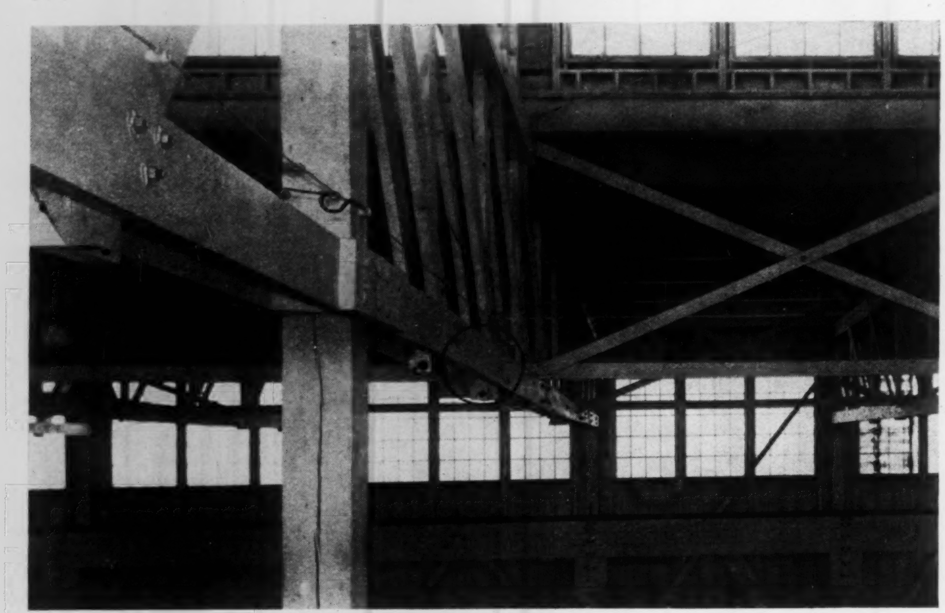
Because of the eccentricity of the joint, the members tended to move out of their vertical position. When the core sheared, all the force on the ring connector had to be taken by the leading edge, and this force immediately split off the edge of the horizontal 3 by 8-in. timber. It is evident that the failure of this joint was inevitable and complete, when the core of wood which lay within the split-ring connector was sheared off. The usual relationship between the proportional limit and the ultimate value of connector assemblies is not applicable to this joint because, if a factor of safety of four on the ultimate strength of the joint were to be maintained, the safe load on this joint could not be greater (it might be less) than one-fourth of the value of the connector assembly just before the core was sheared (after adjustment for long-time load moisture content, and so forth).

There are two conditions when the value of safe loads thus mentioned would be less than one-fourth of the value of the standard connector assembly just before the core is sheared. The first condition is that found when a ring is installed in a member of narrow width in side bearing. Here the core will take a larger percentage of the total load than it would take if the timber were very wide. For instance, it is evident that if the ring in side bearing is close to the edge of the timber, the stiffness of the wood resisting the force of the leading side of the ring is much less than the stiffness of the larger depth of wood which is in the core. If a 4-in. round ring is placed in the $5^1/_2$-in. face of a timber, and a load is applied toward the edge of the timber, it is evident that only a small portion of the load will be resisted by the thin strip of wood outside the ring. This was the case with the 3 by 8-in. horizontal member in the tests pictured in Fig. 1, where it was noticed that the fibers above the ring showed considerable movement, allowing the core to take somewhat more than the percentage of ring load which it would have taken if the horizontal timber had been a 3-by-12, with the ring farther from the edge of the timber.



A TEST SPECIMEN AFTER FAILURE

The second condition is that which prevails when the slope of grain of the timber lies along the plane of maximum stress. In this condition the timber may split



TIMBER TRUSS JOINT (CIRCLED) HAS FAILED THROUGH SPLITTING OF DIAGONALS
Stitch Bolts Were Added After Failure Occurred

along annual rings before the core has reached a point of incipient failure.

The critical nature of the tension-across-grain stresses is recognized when it is recalled that the maximum allowable safe stress in this direction in timber is usually said to be less than 50 lb per sq in. for the common structural woods. The practice in building codes is not uniform in this regard. Some building codes do not allow any tension across the grain. These wide variations are prevalent because of the uncertainty inherent in an estimate of the internal stresses in the timber, especially the stress due to uneven moisture content near the end of the stick. (See "The Glued Laminated Wood Arch," by T. R. C. Wilson, Technical Bulletin No. 691, U.S. Department of Agriculture, pp. 53–54, 58, 66.) Where the defects in the timber, the moisture content, and the uses of the timber structure are carefully controlled, as is frequently the case with timbers built up of many glued laminations, it is reasonable to permit a higher safe tension-across-grain stress than should be allowed in timbers having properties not well known or not well controlled.

PLACING OF CONNECTOR ASSEMBLIES

Where more than one connector assembly is used in a joint, the position of these assemblies is quite important. In the example illustrated in Fig. 2, both split-ring assemblies are approximately on the center line of the diagonal 3 by 12-in. members. For this reason the ring connectors act together in producing tension-across-grain stresses in these diagonals. Since neither the vertical center member nor the horizontal outside members have high tension-across-grain stresses, the value of the joints would be increased by placing the connector assemblies staggered in some way in the diagonal members, and if necessary on the center line of either the vertical or horizontal members. By placing the bolts in this manner, it would be possible to reduce the tension across the grain to 50% of that in this joint as shown in Fig. 2.

The accompanying photographs show some of the failures that occurred in a large truss structure using the joint detail of Fig. 2. The magnitude of the forces assumed for the design of the members in the structure is shown on the free body diagrams, Fig. 2 (*a*), (*b*), and (*c*). The joint failed at a continuous load of approximately three-quarters of the design load. The timbers did not fail in all respects exactly alike even though the trusses were all prefabricated from the same patterns and installed in exactly the same way, the only variation being in such circumstances as time of day, quality of workmen, and nature of the grain of wood. The ends of both diagonal members of one joint shown split into four parts. At other joints these members split into three parts, and at one joint one of the members split into only two parts.

It may be seen that the structure consisted of tandem trusses about 20 ft apart. Because these trusses are continuous over the center support, the shear at the interior ends of the trusses is greater than that at their exterior ends. The truss was approximately symmetrical about the center columns. The corresponding joint near the end of the exterior truss did not fail in any case in the entire building, while distress or failure was evident in a large percentage of these joints near the interior ends of the trusses. The uniformity of the damage indicates conclusively that the failure is no fault of the quality of the timber but is entirely caused by improper design—a design which neglected to provide adequately for the tension-across-grain forces.

When the connector-ring group is close to the end of the timber, the tension-across-grain stresses induced will be much larger than those of the connection some distance from the end because of the discontinuity of the timber. The end thrust of the ring connector on the

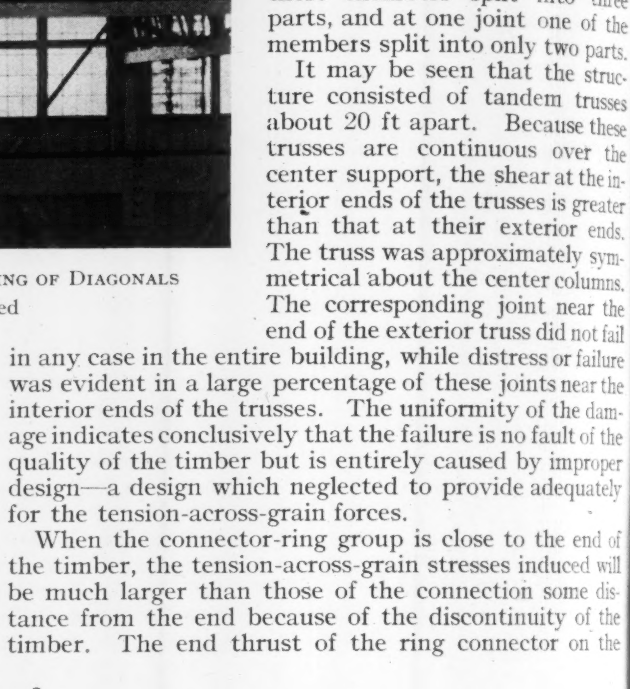


FIG. 2. DIAGRAM OF A TYPICAL TIMBER JOINT USING RING CONNECTORS

wood also produces some tension across the grain. However, the intensity of this stress produced by a ring load parallel to the axis of the timber only is quite small, the timber being adequate for this stress under the design procedure in common use today. Unfortunately it is under this condition of high tension across the grain, produced by ring groups near the end of the timber, that the internal stresses due to uneven moisture distribution make the timber most likely to split. The moisture content will vary most widely near the end. The timber may be split by careless seasoning and thus be less able to resist these stresses.

If stitch bolts are placed between the last ring group and the end of the timber, and between the interior ring groups, it may be possible by careful design and maintenance to prevent the failure of the timber by splitting. The stitch bolt should, of course, be designed for the full amount of the tension produced in the connection since the amount of tension which is carried by the wood will vary according to the tightness of the stitch bolt and will change with each change of moisture content of the wood.

Typical Joint Showing Extent of Failure

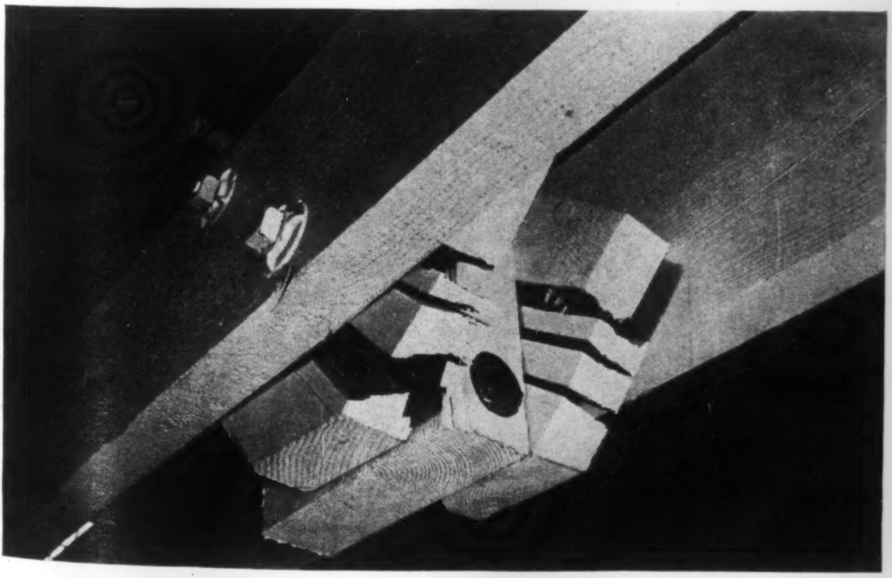
Washers must be designed of adequate size and strength to transfer the tension in the bolt to the timber without over-stressing the wood in side bearing. As the wood changes dimensions with changes in its moisture content, the stitch bolts must be tightened from time to time. This may not be practical when the timber is exposed to the elements, since compression shrinkage could repeatedly reduce the section of the timber and loosen the bolts as moisture content changed with weathering.

The effect of change in the depth of the timber was previously considered, and it was shown that, as the distance of the ring from the edge of the timber increases, the increased stiffness will allow the leading edge of the ring to carry its share of the load. There will possibly be some change in the concentration of stress near the edge of the ring as the thickness of the timber is changed. The stress, of course, will not be uniformly distributed through the entire thickness of the timber at the edge of the ring, but will vary with the maximum tension at this point. This distribution of stresses will vary according to the contact between the timber members and the tension in the bolt producing it.

In the light of the failures in tension across the grain which have occurred in timber structures, it is of utmost importance that the serious nature of this condition be recognized and investigated by every engineer connected with such work. Few if any lives are likely to be lost, because a sudden failure which would leave the occupants unwarned of the pending danger is improbable. Fortunately, timber structures do not usually fail without considerable movement and cracking noises at some time before actual collapse, so that often measures can be taken to brace or support the existing structure before other equipment or structures are damaged. But unnecessary time and labor are consumed in repairing existing structures. To avoid this, it is recommended that each timber structure which has already been built be thoroughly inspected to locate and determine the extent of existing failures, or to locate joints that are on the point of incipient failure.

Strengthening of joints that have not yet failed is usually possible and will avoid the greater expense and delay that would occur if the strengthening were not done. When failure has occurred, it is necessary, of course, to replace broken members, as well as to design and install strengthening features which will prevent a recurrence of the failure.

For the photographs of the large truss structure included here, and for the privilege of inspecting the details of this failure, the writer is indebted to the Henry Mill and Timber Company of Tacoma, Wash., who designed, built, and took full responsibility for the structure. They repaired the trusses by placing new diagonal members with stitch bolts at the locations where failure occurred.



Close-Up of End of a Diagonal Member Shows Displacement of Splinters

Construction Plant for the Fontana Project

Part II. Concrete Mixing and Placing Equipment

By R. E. MARTIN

CONSTRUCTION PLANT JOB ENGINEER, TENNESSEE VALLEY AUTHORITY, KNOXVILLE, TENN.

BELT conveyors and construction trestles are being used to place the 2,800,000 cu yd of concrete that will become the Fontana Dam: construction is progressing 24 hours a day to meet the scheduled closure of the gravity dam in the spring of 1944. Design of the project was described in the July 1943 issue, and Part I of Mr. Martin's article, on the aggregate and cement plants, appeared in the November "Civil Engineering".

SIXTY miles above the mouth of the Little Tennessee River construction is progressing on the highest dam east of the Rocky Mountains. Dominating the site are the construction trestles with their hammerhead and revolving cranes carrying materials into place in the structure. The rugged mountain terrain has made it impossible to locate all the construction plant directly at the dam site. The whole is tied together by a network of belt conveyors totaling more than two miles in length. The aggregate plant and cement silos described in Part I, feed their materials to a central concrete mixing plant.

This fully automatic concrete plant is on the right bank of the river, so located as to reduce the problem of concrete delivery to a minimum. It had been determined that concrete would be placed in the dam from three construction trestles and that it would be taken out to the placing cranes on buckets on flat cars hauled by locomotives. Its transportation from the mixing plant to the construction trestles could best be handled by belt conveyors; hence it was necessary to locate the mixing plant so that these conveyors would not exceed the maximum recommended angles of inclination or declination, taking into consideration the fact that aggregate also would be delivered to the plant by conveyors.

The mixing plant building proper is a steel structure, approximately 115 ft high, octagon in shape, and having a total storage capacity of 1,350 cu yd including two central compartments for bulk cement with a total storage of 230 cu yd, or 1,500 bbl. Arranged symmetrically around the cement compartments are the aggregate bins, of which three are allotted to sand two to cobbles, and one each to fine rock, medium rock, and coarse rock.

The two cement batchers are filled through the use of a screw conveyor and each is driven by two electric motors of different speeds, arranged to provide major feed at high speed and final feed at low speed. Emergency cutoff gates are likewise provided.

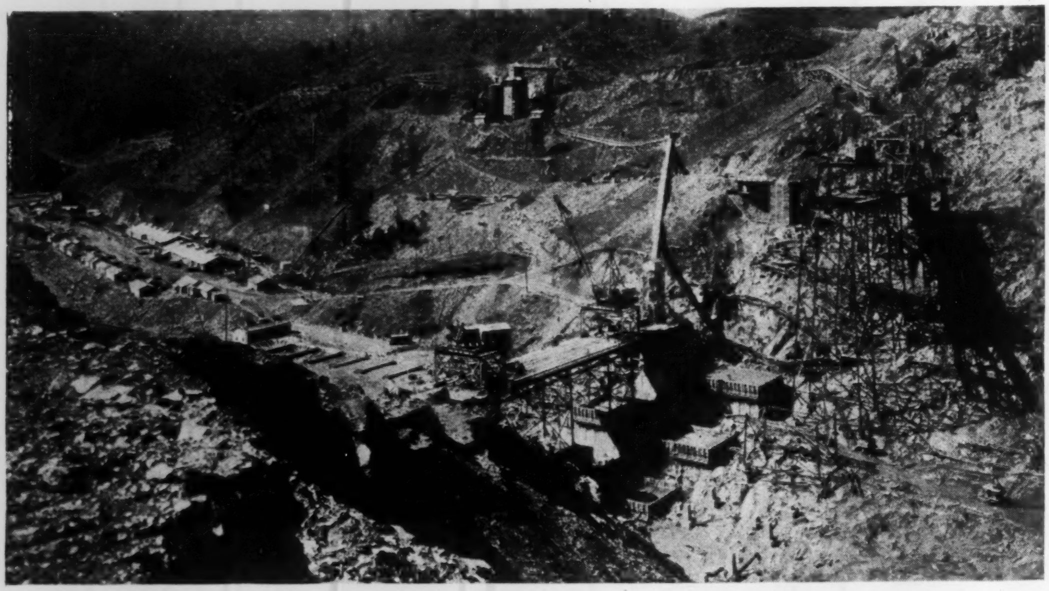
Water is fed by gravity from an overhead storage tank by means of two valves, one for major feed and one for final feed, each operated by an air ram controlled through a solenoid-type air valve. Ahead of the fill valves a riser pipe is provided to prevent water hammer. An adjustable throttle valve in the exhaust line prevents too rapid closing of the valve, with damage to the valve seat.

Weigh batchers are automatic and complete with weighing mechanisms, with dust-tight beam boxes and over-under indicator dials. The batcher hoppers and weighing mechanisms provide for quantities as follows:

Sand	2 at 4,000 lb
Aggregate	4 at 5,000 lb
Cement	2 at 3,000 lb
Water	1 at 250 gal

Aggregate batchers are filled by gravity from overhead bins through radial-type gates operated by air rams controlled from solenoid-type air valves. For each batcher, an emergency cutoff gate is provided between the bin and the radial gate. The batchers discharge through a gate of the toggle locked type, actuated by an air ram.

For the entire mixing plant the control is fully automatic, with batcher operation and mixer operation controlled by one man. A central control station is so located that the operation of the batching equipment and the operation and dumping of the mixers are visible from the desk-type control stand. Signal lamps, pushbutton stations, selector switches, and other control devices are on the top of this stand.



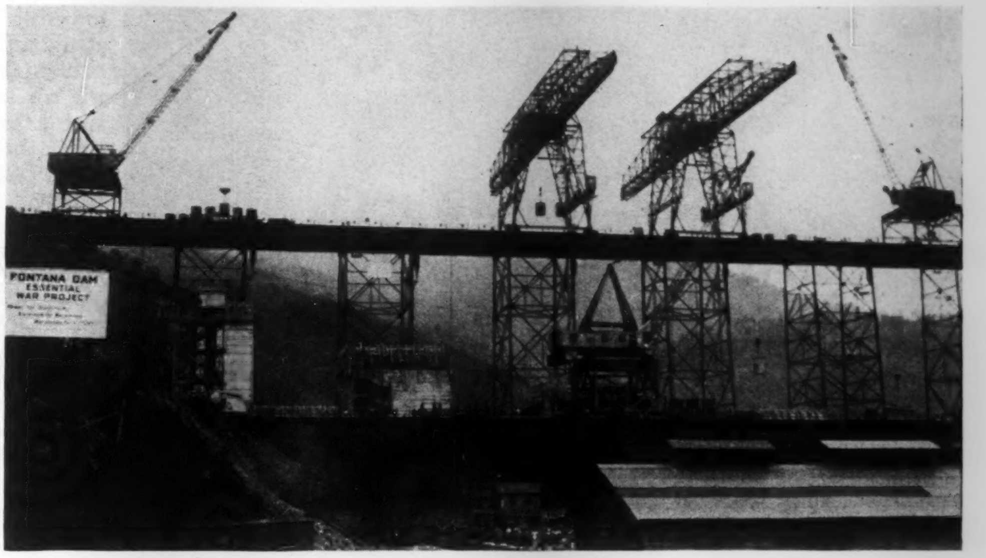
FONTANA DAM SITE WITH CONCRETE PLANT IN BACKGROUND
Construction Trestles Were Being Erected When This Photograph Was Taken

The following features of control are incorporated in the plant:

1. Pushbutton control for starting the batching cycle and, in case of emergency, for stopping it.
2. Pushbutton con-

trol for emergency manual filling of any batcher or for increasing the weight by small increments of material.

3. Pushbutton control for overweight removal from the water batcher.
4. Provision for cutting out any batcher from the batching cycle.
5. Provision for opening and closing batcher discharge gates by electrical control.
6. Signal lamps to indicate when batchers are filled to the correct weight.
7. Glass-enclosed Browncoil-operated remote indication pointers, showing the positions of the pointers on the over-under indicators of the batcher scales.
8. Pushbutton control to operate magnetic starters for the mixer motors.
9. Provision for dumping and righting the mixers by electrical means from the central control station. Dumping control is manual, and righting control is either manual or automatic, with provision for time adjustment. It is not possible to dump a loaded mixer until the mixer timing cycle is completed, as determined by the batch meters.



Construction Trestles Used in Moving Materials Into Place on Fontana Project
Storage Hoppers for Wet Concrete at Left Abutment

The best concrete day as of November 1, was on August 23 when 9,213 cu yd of concrete were produced. The best eight-hour shift production is 3,644 cu yd. As of November 1, 1943, a total of 1,160,000 cu yd of concrete had been placed in the main dam structure.

For batching and mixing grout, a small auxiliary plant has been set up from which grout can be handled directly by the cranes. This eliminates the problem of coordinating the belt system and concrete storage hoppers, as these ordinarily would have to be cleared to accommodate grout mixed in the central plant.

There is a total of more than two miles of belt conveyors in the system at Fontana. In general, the conveyors were laid out to conform to the contour lines to keep supports to a minimum. Every effort was made to avoid the use of steel, and where it was necessary to span roadways or deep hollows, existing conveyor bridges were remodeled to suit the purpose. The maximum angle of inclination for aggregate conveyors was set at almost 18° or a bevel of $3^{7}/_{8}$ in. in 12, and for concrete conveyors, slightly over 13°; the maximum angle of declination is almost 18° and 11°, respectively. Conveyors are 24, 30, 36, and 42 in. wide.

Troughing idlers are of the three-pulley type, provided with tilted mounting for training the belt. Return idlers are of the one-piece type. All pulleys are arranged for convenient one-side-type pressure grease lubrication. The drive assemblies comprise motor, speed reducer, base, flexible couplings (where required), and roller chain if necessary to obtain the final speed desired. Belting of cord-type construction is used on the conveyors subjected to severe duty, while the conventional duck-type belting is used on the other conveyors. All transfer chutes or hoppers are lined with removable liner plates made of abrasion-resistant steel. Hoods are provided over all the conveyors.

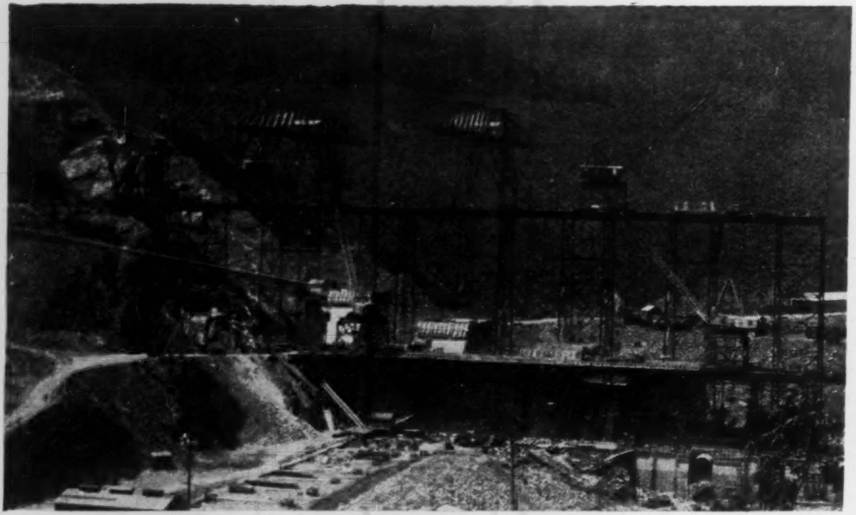
Since it was recognized that the conveyor belts were a critical item, every precaution was taken to protect and extend their life. Rubber-disk idlers are used at loading points on all concrete conveyors and on all aggregate conveyors handling cobbles. Feeders assure a more uniform feed on the belt. Special curved chuts are provided with grillage to cushion discharge onto the belt. In some cases, an extra ply was added to the belt. Pulleys are made extra large.

Self-alining troughing and return idlers are used on the suspension bridges. The minimum rather than the maximum idler spacing is used. One revolving brush and one belt wiper are installed at the discharge end of all aggregate conveyors, and one brush and two belt wipers on the concrete conveyors. A belt wiper is installed on the return belt of all conveyors to deflect any material before the belt passes over the tail pulley. Belts are spliced by vulcanizing rather than by using fasteners. Pickling-table idlers are provided to reduce troughing and for support between the head pulley and the standard idler. They are also provided on the return from the tail pulley.

Concrete is discharged from the five 4-cu yd concrete mixers into a common wet-batch hopper to which is attached a radial-type cutoff gate, operated by air ram. Thence conveyors transport the concrete to the powerhouse trestle, a distance of 1,120 ft, to two 20-cu yd storage hoppers, measuring 5 ft in diameter by 25 ft high, which are supported on the trestle; conveyors also transport it to the low-level trestle at the dam, a distance of 1,257 ft, to four hoppers of the same size. To serve the high-level trestle at the dam, the four storage hoppers and conveyor serving them will be relocated.

Concrete is directed to either hopper at the powerhouse trestle by means of an air-ram-operated tilting-chute, and to the battery of four hoppers by a manually operated turnhead. All hoppers are equipped with air-ram-operated radial cutoff gates, and are sufficiently elevated to permit access under them for standard-gage flat cars carrying 4-cu yd concrete buckets. The operator who rides the flat car fills the buckets by gravity and also hooks the buckets on the cranes. These buckets were designed and built by the Authority. They are equipped with extra-large discharge gates, air-ram operated, and will completely discharge in less than 2 sec.

Concrete is hauled to the placing cranes by locomotives of three types—25-ton diesel electric, 18-ton gasoline,



DAM SITE WITH CEMENT UNLOADING TERMINAL IN BACKGROUND

and 15-ton diesel. The 15-ton locomotives, originally 36-in. gage, were used in the construction of the 43,000-ft tunnel at Apalachia, after which they were revamped to standard gage. Ordinarily four loaded buckets are hauled, leaving space on the flat car for one empty bucket.

All concrete is placed by gantry-type electric cranes, operating from three steel construction trestles. Trestles were selected after careful study of other possible methods. Cableways were considered but would have involved expensive runways requiring extensive trestlework owing to topographic conditions, as well as highly specialized mechanical and electrical equipment, which was difficult to obtain in wartime. The fast construction schedule would require four cableways, which could not conveniently be located so that they could operate over the small area of the dam. With a slower rate of pouring concrete, the cableway scheme might have proved effective.

Construction trestles were more flexible and offered the possibility of starting pouring at an earlier date, as after a few spans were erected, concreting could proceed simultaneously with trestle erection. Four cranes, as well as hauling equipment, were available for transfer, and these various considerations dictated the use of steel trestles. Approximately 5,600 tons of steel are contained in the three trestles which have spans of 60 ft and tower spans of 40 ft. Additional data are given in Table I.

TABLE I. DATA ON STEEL CONSTRUCTION TRESTLES USED ON FONTANA PROJECT, IN FEET

TRESTLE	POWER HOUSE	DAM	
		Low Level	High Level
Length	800	1,000	1,540
Distance, upstream face of dam to center line	309.5	125	125
Elevation, base of crane rail	1,360	1,490	1,685
Maximum height—base of crane rail above base plates	80	210	210
Gage of crane rail, center to center	43	43	43

The two initial trestles were erected with full-revolving cranes, which were used also for placing concrete. The steel towers are imbedded in the concrete. The entire deck structure of the low-level trestle, with several spans from the power-house trestle, will be used in the high-level trestle.

Each trestle was originally planned for three concrete tracks with crossovers and with removable deck panels for facilitating the placing of concrete under the deck by lowering the buckets between the track stringers. It was found to be more expedient to remove the center track from the low-level trestle. The trains leave the storage hoppers on one track and return on the other, a crossover and run-around track being provided at the ends of the trestle. Some concrete is placed under the bridges by drifting the concrete buckets by means of a tugger hoist.

On the power-house trestle there are two electric concrete-placing cranes full-revolving, of 40-ton capacity, with 125-ft booms, and a capacity of 22,000 lb at maximum radius. These cranes were purchased new for the Cherokee Dam, built in 1941. They also handle the penstocks and will be used in the construction of the power house.

On the low-level trestle at the dam, the two outside cranes are full-revolving and of the same rating as the power-house cranes. These cranes were obtained from Friant Dam. Between them are two 300-ft. double cantilever hammerhead traveling cranes with a rated capacity of 22,000 lb at 150-ft maximum trolley travel; these hammerhead cranes were purchased new and are practically duplicates of those used at Grand Coulee. Their operating speeds are approximately as follows:

Lifting empty bucket	750 ft per min
Lowering loaded bucket	375 ft per min
Trolley travel on boom	300 ft per min

A short trestle, approximately 310 ft long, will be erected to facilitate concrete placing in the spillway section. The gantry gage will be changed to 30 ft to suit this trestle, which was used previously at Cherokee and Douglas dams. One of the revolving cranes from the power-house trestle will be moved over to the spillway site.

PROTECTION AGAINST SILICOSIS

Because of the large percentage of free silica in the rock (about 80%), preventive measures have been taken against silicosis. Wet drilling is employed at the quarry, and the rock is sprayed as it is dumped into the primary crushers. Water sprays are also used at several transfer points and at several screening operations. Dust collectors of the wet type were installed at the primary crusher, crusher building No. 1, crusher building No. 2, and at the rod-mill surge bin. The capacity of the units installed is, respectively, 10,000, 23,000, 18,000, and 12,000 cu ft per min. The screens in crusher buildings Nos. 1 and 2 are completely housed.

A centrifugal ventilating fan with a capacity of 20,400 cu ft per min was installed in the dead-end tunnel under the primary stockpile, and a propeller-type ventilating fan of 12,600 cu ft per min in the main reclaiming tunnel. There is also a dust-collector system at the mixing plant, and at the cement unloading terminal to remove the dust nuisance at these points.

All construction is under the general supervision of A. L. Pauls, M. Am. Soc. C.E., Chief Construction Engineer. F. C. Schlemmer has been Project Engineer since June 1943, succeeding C. E. Blee, M. Am. Soc. C.E., who is now Chief Engineer. G. E. Murphey is Construction Superintendent; Oren Reed, Construction Engineer; R. T. Colburn, M. Am. Soc. C.E., Construction Plant Engineer; and Frank Cadena is in general charge of the operation of the aggregate plant.

Treatment Conserves Water at Steel Plant

Final Liquid Wastes Eliminated at Fontana, Calif.

By ARTHUR TAYLOR *and* NELSON TAYLOR, MEMBERS AM. SOC. C.E.
CONSULTING ENGINEERS, LOS ANGELES, CALIF.

KAISER'S Fontana steel plant is unusual for a number of reasons. For one thing, no liquid wastes flow off the property. To balance the large volume of process water needed for steel manufacture against the limited supply of ground and surface water, it was found necessary to treat and reuse all process water. Two separate systems treat water—one for domestic and the other for industrial use. This paper was originally presented before the Sanitary Engineering Division at the Society's Los Angeles Convention.

LOCATION of the West Coast's first complete iron, steel, and coke plant was the result of a happy compromise. A seaboard location would have been preferred by an industrialist; inland, back of the Coast Range, was the choice of the military. The compromise was Fontana, Calif., 50 miles east of Los Angeles. The site selected, of 1,300 acres, is served by transcontinental railroads. It has good housing and living facilities in the heart of an extensive agricultural valley. For postwar production, the location is well centered for distribution, north, south, east, and west. Ground was broken in April 1942. The blast furnace was lighted before the New Year, and facilities were ready to keep it in continuous operation.

The Fontana plant, as distinguished from most iron and steel mills, is not along a river or lake where water is plentiful and disposal matters are simple. The site is over the Chino ground-water basin, and is traversed by the main aqueduct of the Metropolitan Water District, from which an additional water supply can be obtained should the local resources prove inadequate, or should there be an appreciable expansion program.

At present the water supply is obtained from the Fontana Union Water Company, a mutually owned concern with long perfected rights to the water of Lytle Creek, the underground water of the Lytle Creek cone, and the upper Chino Basin. Standby water is available on the steel-mill property from deep wells equipped with electric-driven turbine pumps.

In Southern California, where a great part of the domestic and industrial water is imported from the High Sierras and the Colorado River, it is simple logic that conservation and reuse of water be practiced to a high degree. At the Kaiser plant the conservation principle has been adopted to the fullest extent. Reclamation through treatment makes reusable all the water circulated for use in all cooling operations, in the blast-furnace gas washers, as well as pickle liquor and rinsing water, rolling-mill scale-flushing and cooling water, domestic sewage, and water employed in other lesser uses.

THE WATER SYSTEM

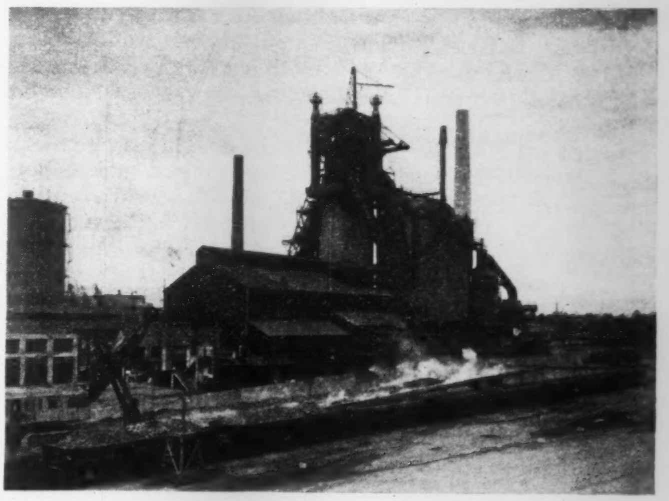
The stream supply and the well waters are all of relatively good quality, and high turbidity occurs only occasionally in the stream source. Treatment is applied to all incoming water, giving partial reduction of carbonate hardness through lime feeding followed by recarbonization and rapid sand filtration.

Two types of water use suggested the installation of two separate water works—domestic and industrial—after the initial treatment of the whole supply. However, boiler feed water is included in the domestic system. The general treatment plant serves both distributing systems, as its effluent is divided into two parts. One part flows into a concrete-covered domestic reservoir of 750,000-gal capacity; the other part overflows the domestic reservoir into the 1,250,000-gal open concrete industrial reservoir. Elevated water tanks of reinforced concrete with a capacity of 250,000 gal each serve the domestic and industrial systems with equal static pressure. The two systems can be tied together only by closing a pipe-line gap in case of emergency. A standby pump, gas-engine-driven, is ready to serve the domestic system, and two steam-turbine driven standby pumps afford standby service for the industrial water-supply system.

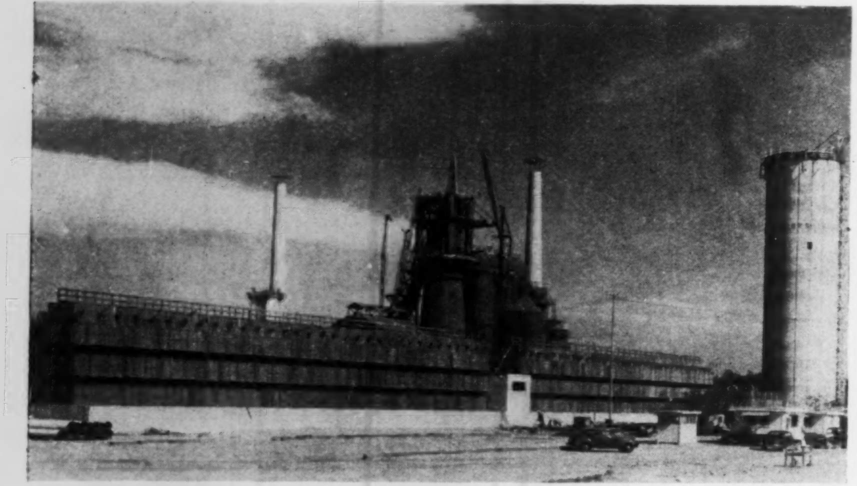
For the entire steel plant, after the completion of the plate mill and the structural merchant mill, 3,300 gal per min is the estimated supply of water required. Practically this is the amount lost through evaporation, with small allowance for occasional blow-down and losses such as those necessary with the disposal of sludges and inert wastes. However, no liquid wastes flow off the plant property. Of this total consumption, 2,200 gal per min is industrial make-up water, and 1,100 gal per min is domestic and boiler-feed water. From the domestic water, 300 gal per min is salvaged after treatment at the sewage treatment plant. The total flow in circulation for industrial and domestic uses is 47,000 gal per min, roughly 14 times the make-up.

TREATMENT PLANT FOR GENERAL SUPPLY WATER

The plant for treating the general water supply consists of two 50-ft diameter hydrotreaters in parallel, receiving metered water from a regulating chamber that has taken the flow from a sand trap after a short cascade aeration. Coagulant and lime are introduced by automatic feeders, and are proportioned by propeller meters and timers. Based on a rising rate of $1^{1}/_{2}$ gal per min



BLAST FURNACE AT FONTANA STEEL PLANT
Gas Washers at Right and Slag Quenching in Foreground



WATER COOLING TOWERS LOWER TEMPERATURE OF RECLAIMED PROCESS WATER ABOUT 15 F

Reinforced Concrete Storage Tower at Right

per sq ft in the sludge-blanket precipitating and clarifying basins, each has a capacity for 3,000 gal per min. The effluent goes to a common box where the flow is divided, thence through a recarbonation basin and three rapid sand filters. All the water goes through the domestic reservoir, which by overflowing supplies the industrial reservoir. However, all or part can flow through to the industrial reservoir through its recarbonation basin; or industrial water can bypass the treatment plant completely.

The carbonate hardness caused by calcium and magnesium content is reduced by feeding lime alone, with the aim of producing water of about 70 ppm total hardness. That part of the domestic water supply to be used for boiler feed is further treated for zero hardness by zeolite softeners in the power plant.

TREATMENT OF BLAST-FURNACE GAS-WASHING WATER

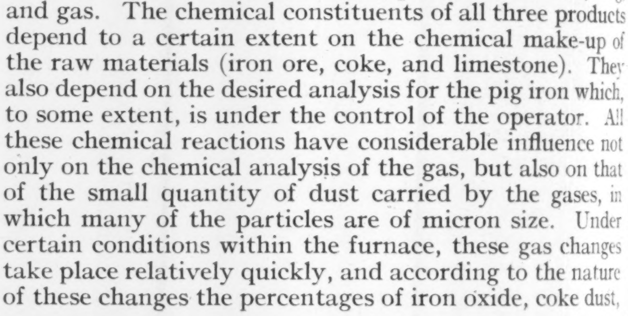
Partial treatment for removing from 80 to 95% of the suspended solids in the slurry from the blast-furnace gas washers and electric precipitators is by natural sedimentation with continuous sludge wiping and removal in a standard Dorr thickener 90 ft in diameter. The solids of this slurry consist of particles of coke dust and iron ore and lime in a finely divided state, the quantity of solids being from 500 to 1,500 ppm. Natural precipitation in the thickener produces an effluent of from 100 to 170 ppm; but, with $1^1/_2$ grains per gal of ferric chloride applied as a coagulant in the center feed well of the thickener, the effluent can be reduced to 30 ppm of suspended solids.

Justification of the expense of the coagulant chemicals depends upon the value of the recovered iron and carbon, and the necessity and benefit of having a clarified thickener effluent. If the water is to be used exclusively for gas washing, only reasonable clarification is important. At the present time all the effluent from the thickener flows to the main industrial cooling tower, but it appears advisable to improve the water so as to prevent excessive accumulation of suspended solids and to recondition for alkalinity control.

The loss of water in the thickener operation is about 3%, some by evaporation and some with the sludge. When the iron content of the sludge warrants recovery, it will be pumped to filters for sinter processes, and most of the water will flow back to the thickener. Instead of returning the 3,000 gal per min from the thickener to the main cooling tower to be mixed and cooled along with the other industrial water, it will be treated to make it less depositing in character. Part of it will be reused in the main industrial system and the remainder will be reused after cooling in its separate tower for the gas washing. Actually 700 gal per min will be borrowed from the main system and used with the other water circulating through the gas washers, and 700 gal will flow continuously back to the main circuit.

The treatment of this by-passed supply of 3,000 gal per min will be in a sludge blanket-precipitation basin. The returning water, at a temperature of about 105 F, will be cooled in an atmospheric cooling tower to 90 F and recirculated by pumps to the gas washers at the rate of 2,300 gal per min, leaving 700 gal per min for return to the industrial system. Chemical feeding will be primarily for softening and clarification, and a turbidity of 25 ppm will be considered tolerable.

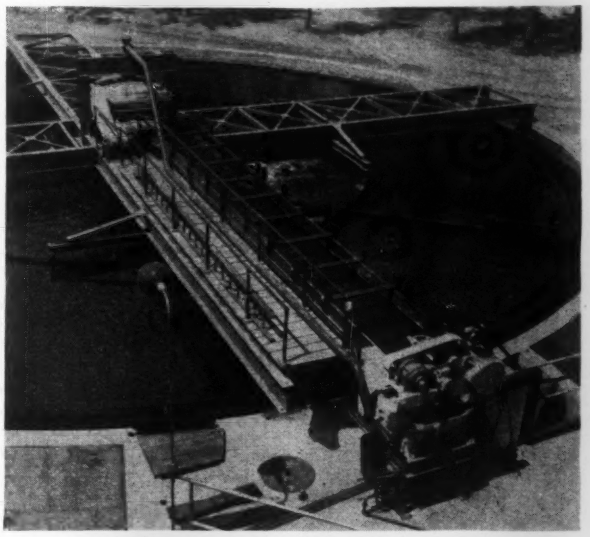
The blast furnace acts as a great chemical retort in which many complex chemical reactions take place, these reactions varying from top to bottom in its 100 ft of height. It is charged with iron ore, limestone, and coke, and air under pressure is blown in through tuyeres at the bottom of the shaft. Final products are iron, slag, and gas. The chemical constituents of all three products depend to a certain extent on the chemical make-up of the raw materials (iron ore, coke, and limestone). They also depend on the desired analysis for the pig iron which, to some extent, is under the control of the operator. All these chemical reactions have considerable influence not only on the chemical analysis of the gas, but also on that of the small quantity of dust carried by the gases, in which many of the particles are of micron size. Under certain conditions within the furnace, these gas changes take place relatively quickly, and according to the nature of these changes the percentages of iron oxide, coke dust, silica, lime, magnesia, sodium, and potassium vary somewhat. Some of these compounds, after passing through the gas washer and precipitators, are in a solid state, some in solution, and some partly dissolved by the water.



COKE OVENS AT KAISER'S FONTANA STEEL PLANT

Quenching Station at Right Uses Unsalvageable Liquid Wastes

Each hour there is a complete recirculation of all the gas-washer and electric-precipitator water. Tests have shown that the total alkalinity may double in one day, although total hardness has shown an increase of only a few per cent. But this does not always happen; in



Clarifloculator Removes Oil, Iron Oxide, and Other Materials from Rolling-Mill Cooling Water

fact, some days showed only a moderate build-up of the total alkalinity and hardness. Silica builds up, and is a function of the percentage of silicon in the pig iron, which is to a great extent a function of the furnace temperature and the acidity of the slag. Sulfates and chorides build up slowly. Hydrogen-ion concentration persists between 8.2 and 8.6.

The determination of the amount of softening media to apply will have to be based upon the minimum increase in hardness in a given time; and then the rate of feed set at that point, for it looks as though the variations will be too frequent to make it practicable to aim at precise uniformity in the hardness of the effluent.

The initial Fontana project called for a rolling mill for plates only, and this involved the handling of 3,500 gal per min of cooling water. Subsequently the merchant and structural mills and alloy finishing department were added, increasing the amount of water by 5,500 gal per min. The principal use for water in this section is cooling rolls. It picks up scale, dirt, and oil, and is collected in scale pits from which it is pumped to a plant for treatment and cooling.

After serving to cool the rolls during the rolling process, water carries off with it to the scale pits quantities of so-called mill scale. Iron oxides are present as well as small particles of iron; also oil, grease, and dirt. A short retention in the scale pits settles only the heavy particles. Usually this water—with its fines, colloidals, and oils—is carried off in a sewer for disposal in a lake or river. But at Fontana it is collected for reclamation.

The treatment decided on was chemical coagulation followed by sedimentation, along with oil skimming and continuous sludge wiping and withdrawal. The unit for the plate mill, with a circulation flow of 3,500 gal per min, is a 70-ft-diameter clariflocculator having an inner floc basin 36 ft in diameter. The unit for the other mills is similar, but 90 ft in diameter, with a 44-ft inner floc basin. The detention period for coagulation in each is about 30 minutes, and for sedimentation about 90 minutes—the rising rate being approximately 1,700 gal per sq ft per 24 hours. The overflow of these two plants goes by gravity to a basin and is pumped to the sprays of a natural-draft cooling tower. The cold water is then boosted for use in the rolling mills, its pressure being regulated by an elevated tank which floats on the lines. There will be about 18 circulations a day. The losses in this circuit, estimated at 13%, will be made up with fresh water from the main industrial system.

Sludge from the treatment, with its finely divided mill scale, will be pumped to drying beds close by, from which the supernatant flows into the sanitary sewer. The dried sludge may be recovered and sent to the sinter plant. Skimmed oil will be drawn off periodically from decanting tanks.

Coagulants and neutralizing chemicals will be fed. The latter may be commercial lime or lime hydrate. If found satisfactory, calcium carbonate reclaimed from other water treatment, or occasionally from the pig casting operations, may be used in the form of calcium hydrate. Some of the coagulant may be spent pickle liquor, as tests have shown that this liquor, along with enough lime to absorb excess acid, makes a good floc when applied to scale-pit waters. It is expected that such economic use will be made of that liquor, for it will be possible to draw some of it off from the rectifying plant in desired concentrations. Selection of this liquor is possible because pickling vats discharge into their own treatment plant and in such a way that the liquor can be withdrawn when tests indicate the desired concentrations.

Chlorinated copperas, which is a popular coagulant, may be made at the waste pickle-liquor treatment plant or at the clariflocculators by feeding chlorine along with the spent pickle liquor. Or, when the quantity of pickle liquor warrants the making of chlorinated copperas, the latter may be deemed worth-while for making into a by-product.

TREATMENT AND RECLAMATION OF DOMESTIC SEWAGE

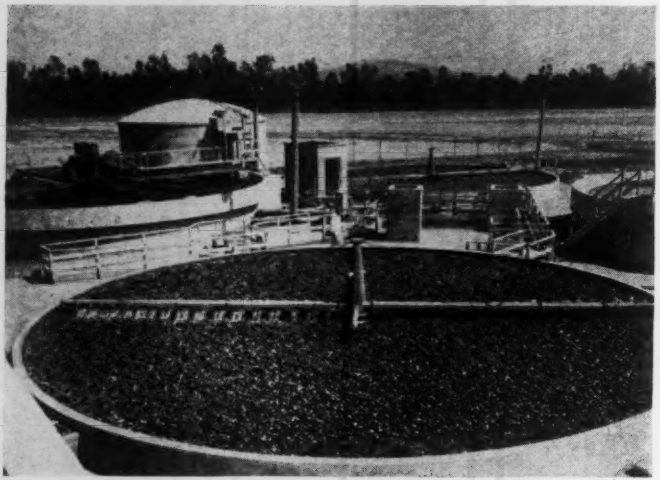
The design of the sewage treatment plant complied with the California State Health Department standards with a liberal allowance for contingencies. The result is a plant that can handle 400 gal per min. The clear and stable effluent, having been rendered safe by final chlorination, is blended with water that serves the rolling mills. The sewage treatment process is two-stage, recirculating, bio-filtration, with several flexible adjuncts. Among these are means for chemically aided flocculation ahead of primary clarification; valve arrangements on the circulating pumps for dividing the flow between the secondary clarifier and the filter; an inner launder in the secondary clarifier to provide for a flow to the final chlorine contact basin; and an outer launder for taking the recirculating supply back to the pump sump.

Designed for a chlorine contact period of 40 minutes, the basin is provided with a helical baffle so that the flow travels 150 ft to get to the center of a 30-ft circular tank. A pump taking suction from the center lifts the reclaimed water to the clariflocculators at the rolling-mill cooling tower. Sludge from the digester is spread on natural gravel beds for drying. It may be recovered for agricultural use, as it would improve sandy soils in the vicinity.

TREATMENT OF WASTE PICKLE LIQUOR

The merchant and structural mills and the alloy finishing department involve processes for acid pickling, and so means had to be provided for treatment of the spent pickle liquor. The treatment will be complete enough to reclaim the water for reuse. The several acid and rinsing vats are dumped into twin sewers of 8-in. diameter, of ceramicweld pipe, which terminate at the pickle-liquor treatment plant; this is located adjacent to the domestic sewage treatment plant for convenience of operation. Estimates indicated that about 45,000 gal per day would be dumped from the various acid and rinsing vats; this quantity was therefore used in determining the capacity of the treatment plant, which is to operate from 6 to 8 hours a day. The receiving tank, which will store one day's disposal of spent pickle liquor and rinsing water, is 30 ft in diameter, 10 ft deep, of Douglas fir. It is built above ground but its elevation is such that the acid sewer will discharge into it by gravity.

The treatment decided upon consists of neutralization of the excess acid by powdered limestone and reaction of soluble ferrous sulfate with the same material. Calcium sulfate will be precipitated from the reactions along with ferrous hydroxide, and the latter will be oxidized to ferric hydroxide and ferric oxide by air forced through the slurry. The size of the spent-liquor storage tank permits treatment at a constant rate which, based on a 6 to 8-hour run, will be at 100 to 125 gal per min. The rate will be controlled by a small tank with a float valve, and an acid-proof pump discharging into the first of three wood-stave mixing tanks, each 14 ft in diameter and 10 ft deep. The fittings and the pump are of acid-resisting materials, including duriron and duramet. Each of the three mixing tanks has a 42-in. duplex mixer or gas absorber.



DOMESTIC SEWAGE PASSES THROUGH COMPLETE TREATMENT AND IS RETURNED AS PROCESS FEEDWATER
Filter and Clariflocculators Shown

Limestone of 100-mesh will be fed into the first tank, and air at 200 cu ft per min will be continuously blown through the slurry in each mixer tank. The slurry in the three tanks will be partly recirculated, 5 parts being pumped from No. 3 tank back to No. 1, and the sixth part will overflow into a wood-stave thickener tank 35 ft in diameter. The laundered effluent of the thickener—equal to the influent less the supernatant for the sludge—flows by gravity to the chlorine contact basin of the sewage treatment plant, whence it is to be pumped, along with water reclaimed from the sewage treatment, for service in the rolling mills.

The acid treatment plant includes a 30-ton bin for powdered limestone, which is lifted by a screw conveyor and bucket elevator from a truck dumping pit. Feeding to the mixers is through a variable-gear-driven vane feeder and screw conveyor, the limestone being introduced directly into No. 1 mixing tank. The 600 cu ft per min of air previously referred to will be supplied through a rotary blower, and the recirculation of 600 gal per min will be by a slurry pump.

The 125-gal per min influent pump is arranged by valves on its suction to evacuate the acid sewers after shutdowns, to prevent crystallization of the iron salts. Sludge will be withdrawn by a diaphragm pump and spread on drying beds—at least until a demand is created and means provided for reclaiming it as a by-product.

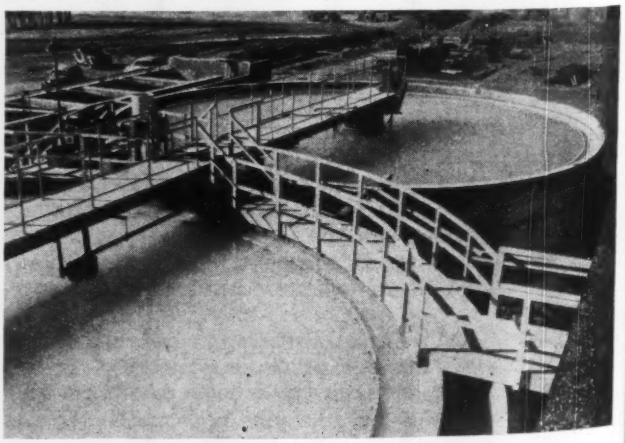
The steel-plant laboratory has about 5 gal per min of waste and rinsing water to dispose of. As a rule, such wastes are on the acid side and might interfere with the biological action if disposed of in the sewage treatment plant. The liquor will be dumped in a small tank by the laboratory, where it will be neutralized by chemicals before being passed into the sanitary sewer.

At the coke and by-products plant, which was designed and built by the Koppers Company, there is a liquid purification plant using the Seaboard process for the removal of hydrogen sulfide and other noxious matter from coke gas. The coke-oven gas, ascending in a tower, is met by a spray of a solution of sodium carbonate; as a result the hydrogen sulfide is oxidized and sodium thiosulfate formed. These salts go in solution to a sump—altogether about 1,250 gal a day. In some large plants these chemicals are removed by fractionating, or are wasted along with the other waste liquors; but in keeping with the policy of reclamation at the Fontana plant, this small amount of liquor is pumped to join a large quantity of water used in quenching coke.

Coke is made in the Koppers Company's Becker-type ovens, which have facilities for recovering the gas of distillation for fuel after it has been stripped of its many by-products. In this company's contract, it was provided that unsalvageable liquid wastes were to be used in coke quenching. This is being done in a manner that prevents the escape of spent liquids by any other means except evaporation, as in quenching, which is a beneficial use. If any waste water drains through, it is picked up and reused. The Koppers Company was specifically committed to prevent phenol from entering the industrial water system or the sewer system. A sodium phenolate plant is operating to receive all phenols, and phenol thus becomes one of the by-products of coke manufacture.

Other water wastes are inconsequential. For instance, in sinter quenching, even though the water used for cooling is uncontaminated, the surplus is conducted through the treatment plant for the blast-furnace gas-washing water. Water used to cool the pig iron and pig casting molds picks up lime hydrate from the molds. It will be piped to the sludge beds of the clariflocculator and may be used as a softening reagent in water treatment.

The emergency necessitated the laying of foundations before the superstructures were little more than a mental picture. The project was super-expedited in Henry J. Kaiser fashion. Under the generalship of George Haras, Kaiser's chief engineer, and with the guidance of George W. Vreeland, Chief Consulting Iron and Steel Plant Engineer, the project has already become a producer of iron and steel.



HYDROTREATERS AT THE SUPPLY WATER TREATMENT PLANT

Manpower in Construction

III. Recruiting Workers

By L. E. Brigham, M. Am. Soc. C.E.

Labor Relations Officer, Construction Division; Office, Chief of Engineers, War Department, Washington, D.C.

In normal times the proper manning of a construction project is a relatively small factor in labor management. With the so-called "manpower shortage," obtaining sufficient competent workers for any project has become a major item. The writer is of the opinion that there is no national shortage even as to competent labor for construction. Indeed it is doubted whether a national shortage of labor exists in any general industry. While the labor market is tight and local shortages do exist for specific trades and industries, there are also local surpluses. Labor is more mobile than fluid in that it can be transported quickly but will flow slowly owing to natural causes.

As indicated in Fig. 1, it is estimated that an average of 1,028,000 men were employed on government construction in the fiscal year 1942–1943. A forcast shows that approximately 600,000 will be the average employment for 1943–1944. The difference indicates an excess available this year of 428,000 construction workers under current employment conditions. If, through labor management methods, the estimated amount of one-third could be saved, this would increase the effective surplus by 200,000, or give a total of some 628,000 workmen available. It is not believed that draft requirements have reduced the ranks of construction workers to any considerable degree.

It is to be noted that Fig. 1 is based on a 300-day year for each employee. Intermittent employment would of course increase the actual number of individuals available by a sizeable margin.

The present labor supply problem may be charged to the following three basic causes: (1) lack of current information on where labor is available; (2) almost no use of existing facilities to mobilize labor; and (3) ineffective utilization of the labor now employed. Number 3 of these items has been covered in previous articles [Parts I and II, by L. E. Brigham, Civil Engineering, October and November 1943].

Employment offices already established and doing business cover practically every locality in the United States—a total of about 5,400 towns with populations of over 1,000. To give an appreciation of their number, the following approximate summary is presented:

U.S. Employment Service, War Manpower Commission

National office	1	
Regional offices	12	
State or territorial offices	50	
Permanent local employment service offices	1,574	
Itinerant local employment service offices	3,000	
		4,637

Building Trades Unions A. F. of L.

Building and construction trades department	1	
International union offices	19	
International union suboffices	190	
State building trade councils	14	
Local building trade councils	500	
Local union offices	7,500	
		8,224
Grand total		12,861

Under directives of the War Manpower Commission, there have been established as of July 1943 approximately 200 Labor Areas, including all cities with a population of 25,000 or more. These areas are classified in the following way:

Class I—Definite labor shortage
Class II—Anticipated shortage within 6 months
Class III—Anticipated shortage after 6 months
Class IV—Adequate labor supply

The classification of any area is based on a monthly statistical summary of supply and demand as modified by opinions, experiences, and information received from public and private officials, who presumably have an intimate knowledge of local labor supply problems. In theory, the manpower control is accomplished by regulating recruiting programs in any area and by restricting employment transfers. Before any new worker can be employed, he must present a release from his previous employer and be referred to the employer by the U.S. Employment Service office. In some instances, a referral by a labor union or availability certificates by applicants are acceptable. The whole system of control is in a state of flux and subject to change as conditions dictate.

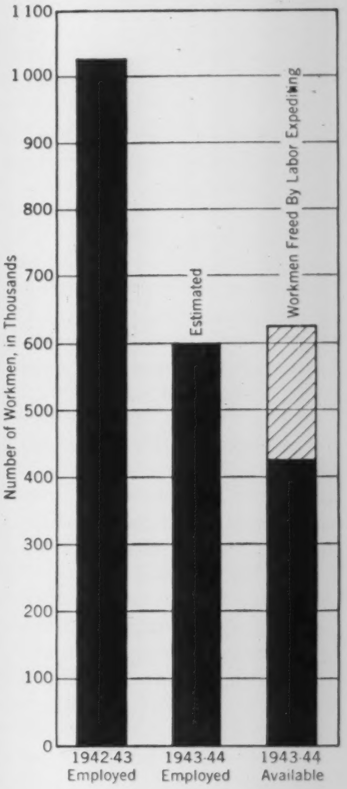


Fig. 1. Workmen Employed on Government Construction

According to present regulations, a local contractor may not advertise through the newspapers or by radio for workers without the sanction of the U.S.E.S., and those workers who are employed must have acceptable clearance. For large jobs, it may be necessary to draw labor from outside the immediate labor area and often from great distances. The plan in such cases is for the contractor to contact the Regional Director of the U.S.E.S., who surveys his immediate area to determine the manpower available. If a sufficient supply is not available, the request is transmitted to the Washington Office of the U.S.E.S., which determines in which regions labor is available, and this information is transmitted back through the regional office to the contractor. Positive recruitment itineraries are then presumably arranged for the contractor's employment agents, and assistance is given in advertising and referral of applicants by local U.S.E.S. offices on this itinerary.

The employment situation in any locality is in such a state of flux that a weekly survey as to men available is desirable. The mechanics of such a survey on a national basis is not difficult, and reports can be made by wire. It is important that a quick and effective follow-back system for employment be developed concurrently. A survey of exactly this type was made in mid-September 1943 by one government contracting agency with very beneficial results. Over 52,000 construction workers were reported available, with indications that many more could be found by a thorough combing of supply points. In a number of cases construction workers were reported in large numbers, in areas of supposedly critical labor shortage.

JOBS OUTSIDE THE CONTINENTAL UNITED STATES

War construction is really on a world-wide basis. Some very large projects are in territories or possessions of the United States, while others are located in foreign countries. Many projects outside the continental United States draw on the same labor areas within the continental United States for their supply of "continental" employees. Competition between foreign jobs and the various contractors concerned as to recruitment of workers has become more acute because of the restrictions imposed by the war. The employment situation existing on the West Coast and in other critical labor areas is typical. Construction workers are often available in these areas but recruitment and clearance are difficult. Where possible, recruitment should be confined to areas where climatic conditions are similar to those existing at the project and where racial strains are adaptable to project conditions.

Basically, the "human element" is the same whether a man goes to Hawaii, Alaska, or South America. This reason alone justifies uniformity of treatment. Such uniformity would also be of great assistance in a general recruiting program which of necessity overlaps between areas, agencies, and contractors. Standard employment conditions would do away with much of the confusion and competition that now exist. From the standpoint of the numerous recruitment offices of the U.S.E.S. and the unions, and the many applicants routed through these offices, the basic employment conditions on all foreign jobs should be the same.

Proper selection of employees, based on reasonable standards as to job qualifications, health, and character, is the greatest single factor in the solution of the problem. Each employee on the project represents a considerable investment through cost of recruitment, transportation, housing, hospitalization, and so forth. A poor or dissatisfied employee is not only a loss in himself but also pulls down the morale and production of other workers. Unfortunately, even this element of outstanding importance has been given only minor attention.

In one of the most active foreign construction areas, a start has been made on systematic employment channeling procedure. The U.S.E.S. has set up a special office to service the projects, but owing to the localized organization of employment offices and other factors previously discussed, it is likely that the present effort will need stepping up to bring satisfactory results. Termination interviews have been used successfully in localized instances, and in one instance resulted in returning about 80% of the men to the job. Some progress has been made in establishing equitable and uniform employment contract procedure, and several definite proposals have been made by the offices concerned.

The labor laws of foreign countries must be observed. Labor native to the country or area in which the project is located, if it can be used advantageously should be employed to the extent of absorbing available surpluses without disturbing local agricultural and industrial needs. Wages and working conditions of native labor should exactly parallel recognized equitable situations in the locality. The "boom-time" gush of American dollars released through local purchases of material and spendthrift imported labor must not seriously affect the local national currency and national life if friendly relations are to be maintained with the United States. Preserving the local economy is a distinct reponsibility and primary function of labor management.

The circumstances surrounding construction on any foreign contract usually make for unsatisfactory conditions. A tremendous amount of construction is concentrated in one locality, usually where practically no construction has been carried out previously. The local labor supply is extremely limited, and that which is available is not trained in modern construction methods. In most instances, any absorption of a great amount of this native labor immediately has a disturbing effect on the economic situation in the locality. The importation of skilled labor is mandatory, particularly of men familiar with modern construction methods. Importation of unskilled labor is very often desirable, but usually is not done because of the native labor available, although this is less efficient.

All imported labor is working in a strange environment, away from home and family, which makes for unrest and low production. The workmen do not understand local labor and vice versa. Languages, customs, clothing, food, are different, which makes supervision difficult and contributes to high accident and sickness rates. Local construction material is difficult to obtain in sufficient quantities as needed, and is often not adaptable to modern construction methods. Engineering design, particularly of buildings, is often patterned after conditions in the United States where the design is made and is not well adapted to the local customs and conditions where construction takes place. This strangeness and unadaptability of the design increase the labor load either through the necessity of redesign or through unusual problems of construction. Labor management is poor and labor costs are high.

For a workman recruit, whether for a job in the United States or abroad, employment standards should be either summarized or spelled out in the form of an employment contract. In either case the employer, employee, and government agency concerned should each have a copy. Some of the points to be covered by such standards are:

1. Pay rate, overtime rate, pay guarantee
2. Pay computation and method of payment
3. Classification changes
4. Leave privileges
5. Transportation expense
6. Subsistence and housing
7. Hospitalization
8. Compensation benefits
9. Employment cancellation
10. Union option

Selection has unfortunately been given very little attention. Each worker brought in from a distant point represents a very considerable investment in both time and money. This investment is not limited to the individual hired, but also includes the effect he has on others. Each applicant therefore should be carefully checked as to job qualifications, health, and character.

A preliminary screening of applicants can and should be done by local U.S.E.S. or other recruitment union offices. Before employment, a careful check should be made on all three elements. The time and expense involved in such a check will bring substantial returns.

NOTE: *These discussions represent the opinions of the author and do not necessarily reflect the policies or attitudes of any government agency.*

Recording Results of Field Tests on Soils

By KARL TERZAGHI, M. AM. SOC. C.E.
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EVERY job involving foundations or soils constitutes a large-scale experiment in soil mechanics. The information obtained from such "experiments" cannot be secured by any other means. On account of the complexity of soil conditions in the field, and of the well-known differences between the behavior of soils in the laboratory and in the field, no empirical rule and no theory pertaining to soils can safely be used until its validity has repeatedly been demonstrated by observations and measurements in the field. As Dr. Terzaghi explains, it is advisable to investigate during construction, by means of field observations, whether or not the assumptions on which the design was based are reasonably correct. If the existence of important discrepancies between assumptions and reality is discovered during construction, it is usually possible to avoid their consequences by taking appropriate measures before it is too late.

CONSIDERING the vital function of field observations of soil behavior, it is deplorable that the customary methods for recording results are most unsatisfactory. Quite often, records with potentially valuable material have had to be discarded as worthless on account of a few omissions which escaped attention at the time the record was filed. Many other records have been stowed away in the archives of construction departments without ever serving a useful purpose because the data were so cumbersome and poorly presented that nobody could afford the time required to unravel and digest them. Therefore the following suggestions for improvement are in order.

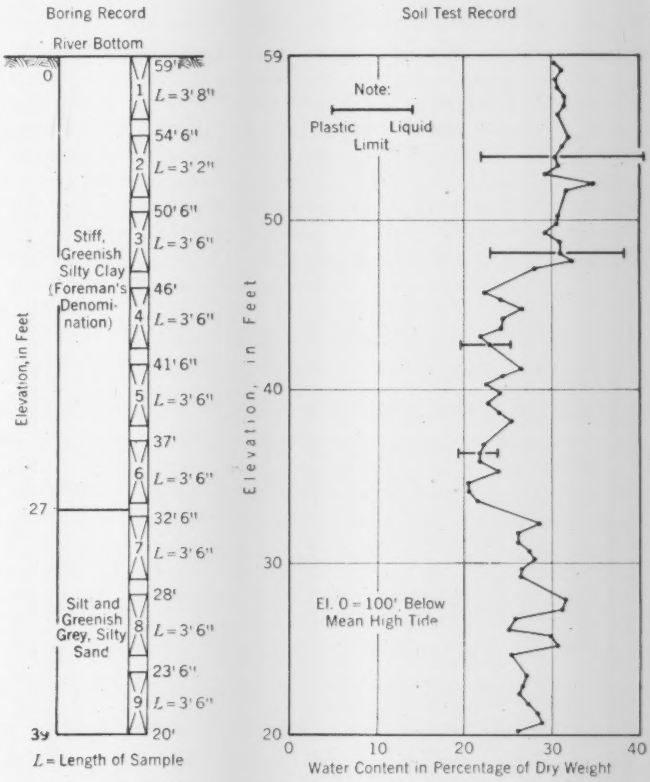
Every field record should be accompanied by a key plan showing the location and elevation of the points of observation. Once a letter or a numeral has been assigned to a point, the designation should never again be changed, because the record of the change is likely to get lost. The key plan should also contain a full description of the principal benchmarks or reference levels. In one instance, in connection with settlement observations in the outskirts of a large city, it was discovered after many inquiries that the principal benchmark was attached to the trunk of a large, growing tree.

Location of borings should be shown on the key plan. If possible, the boring record should be supplemented by the results of classification tests on at least a few representative samples, because experience shows that two different persons may have very different conceptions of the meaning of such terms as "soft," "stiff," "coarse." For clays, these tests should include Atterberg limits and natural water content; for sand, the results of a mechanical analysis and some information concerning shape and mineralogical character of grains, based on inspection under a magnifying glass. The boring record should also carry the date when the boring was made, and a statement of the diameter of casing and type of drilling tools used.

A suitable method of representing the results of routine soil tests is illustrated in Fig. 1. On the right-hand side appears the test boring record, including the soil classification made by the boring foreman. On the left-hand side are the results of the water-content and Atterberg-limit determinations. Every point represents one test result. The tests showed that the stratum described by the foreman as "marl" is far from uniform. They also showed that the results of soil tests on a few samples selected at random can be very misleading; a small number of samples cannot be considered as representative.

If a record contains results of tests on undisturbed samples, it is necessary to add specific information concerning the type of tool and the method used to force the tool into the ground, because both factors influence the degree of disturbance of samples.

Above every column of numerical data should be inscribed the exact meaning of the quantity represented by the figures. In this connection, nothing should be taken for granted. An old, but very important record of water-content determinations on samples from a drill hole had to be discarded as worthless because the observer failed to indicate whether the figures represented water-content in percentage of dry or total weight. It should be remembered that the terms in which the results of measurements are expressed vary from place to place, and at the same place from time to time. It should be possible to ascertain the dimension without the assistance of a detective.



Boring: No. 6   Date: 10/5/43   Foreman: R. E. Smith
Location: See Key Plan   Method of Sampling: 2 In.
Shelby Tubes Pushed into Soil from Scow; Drill Hole Filled
with Water. $2\frac{1}{2}$ In. Casing

FIG. 1. PRESENTATION OF DATA FROM A SHELBY TUBE BORING
(*a*) Test Boring Record; (*b*) Results of Classification Tests on the Samples

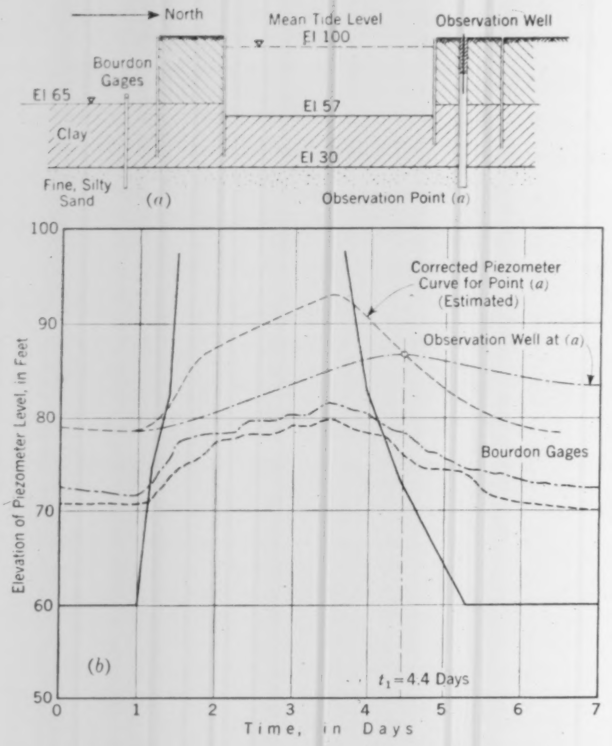


FIG. 2. PRESENTATION OF DATA ON POREWATER PRESSURE

(a) Section Through Two Shipways; (b) Change of Piezometric Pressure in Porewater at Base of Clay Stratum, While One Shipway Is Being Filled and Emptied

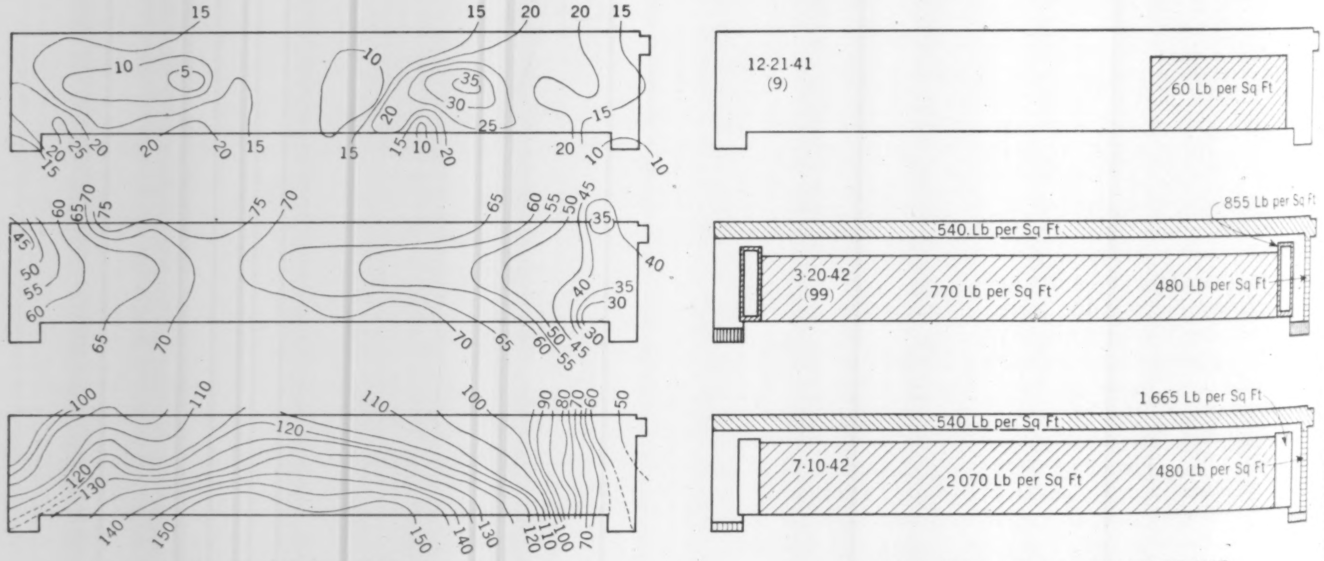
If observations are made too often, they are unnecessarily expensive and the data become cumbersome. If they are not frequent enough, the record has gaps which may not be discovered until too late. On many jobs it is advantageous to start with frequent measurements and to reduce the frequency as soon as the general character of the phenomenon under observation becomes known. Thus much time can be saved without depreciating the value of the results.

The procedure is illustrated in Fig. 2, in which (a) is a section through two shipways and (b) represents the effect of filling and emptying one of them on the piezometric head in a permeable stratum located 30 ft below the floor of the other. The abscissa represent the time, the ordinates of the plain line the water level in the shipway, and those of the heavy dashed and dash-dotted lines the piezometric levels in the permeable stratum computed from the readings on Bourdon gages.

When the shipway was filled for the first time, readings were made once every 6 hours. The results showed that the lag between the change of the free water level and that of the piezometric level is insignificant. Hence, thereafter, as often as the shipway was filled and emptied, only five readings were made: two immediately before and after the shipway was filled, two immediately before and after the shipway was emptied, and one a week after the shipway was unwatered.

In Fig. 2 (b), the thin, dotted line indicates the variations of the water level in the observation well. It plainly discloses the lag due to the resistance against the flow of the water into and out of the well. On account of this lag, the well readings cannot be relied upon. They were discontinued. In a tabulated presentation of the data, the defects of the well observations might have escaped the attention of the engineer who received the data.

The number of observations should not be greater than that necessary to get a fairly accurate picture of the trend of a process. Observations in excess of this number are not only useless; they may even camouflage the real trend. In one instance the deflection of a wall subject to lateral pressure was measured once every day. The results were recorded in tables. After three months the owners of the wall became seriously alarmed, because the data showed that the deflection was still increasing considerably. The trend of the increase was concealed by the inevitable errors of observation. However, after the readings were plotted in a small-scale diagram, it was evident that the average rate of deflection decreased rapidly, and that the wall was approaching a state of equilibrium. It also became evident that the time-settlement curve could have been constructed with sufficient accuracy in a very much shorter



(a) SETTLEMENT CONTOURS
(0.001 Foot)

(b) APPROXIMATE LOAD ON CONCRETE MAT
(Weight of Mat=450 Lb per Sq Ft)

FIG. 3. PRESENTATION OF DATA ON SETTLEMENT OF A RAFT FOUNDATION

(a) Curves of Equal Settlement for the Three Different Stages of Load Application; (b) Corresponding Load Conditions

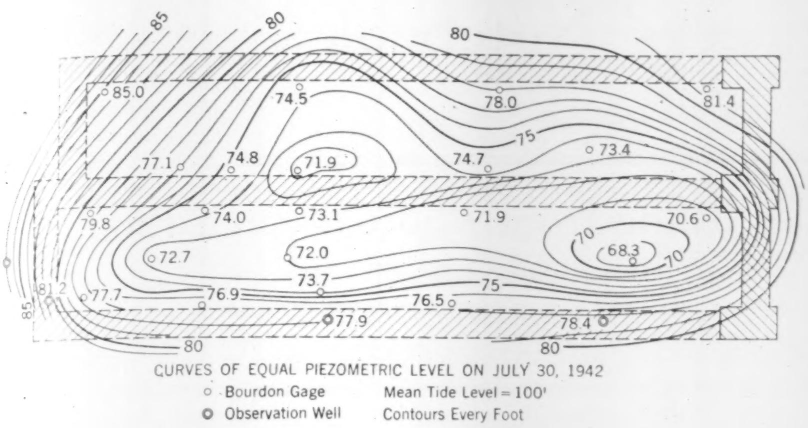


Fig. 4. Curves of Equal Piezometric Elevation at Base of Clay Stratum Beneath the Two Shipways Shown in Fig. 2(*a*) While Both Shipways Are Empty

time if the readings had been made only once every fifth day instead of every day.

In order to get a maximum of information out of a given number of observations, the observer should be given detailed instructions concerning the type of information expected, and at least part of the decision concerning the frequency of observations should be left to his own judgment. If the general trend of the readings can be anticipated, it is advisable to prepare a tentative graph showing expected results and to indicate on it all the points that should be verified by observation.

By the term "digest" is meant the presentation of a field record in a brief and comprehensive form. From such a digest an engineer not familiar with the details of the job should be able to learn, within less than an hour, all the essential findings. The sight of a large sheet covered with figures is so discouraging that such a sheet is unlikely to receive more than superficial attention. A satisfactory digest can best be made by graphically representing the most essential data on a small scale. The graphs should be accompanied by a key plan and a brief, descriptive text.

The original records of field observations can be compared to the original records of the cost-keeper. Every firm or organization takes it for granted that the cost-keeping records must be analyzed and digested as soon as the job is finished. Because of the complexity of the original data, only the digest is of much use to the estimating department. Yet the files of the same organizations are likely to contain voluminous records of field observations which have never been touched since the numerical data were recorded. For anyone not directly connected with a job, the task of digesting such records several years after the observations were made is forbidding, if practicable at all. Hence, such records are likely to serve no purpose other than occupying space in the archives.

In order to avoid this prevalent waste of potentially valuable information, the following procedure should be adopted. As soon as a set of observations is made, the essential results should be introduced into graphs to be plotted on such a scale that they cover the entire period of the proposed observations. If the man in charge of the observations is not competent enough to select the type and scale of these graphs, he should be properly instructed by his superior. If periodic reports are to be presented to headquarters, the complete data should be accompanied by the small-scale graphs.

The benefits to be derived from an appropriate selection of graphical means for presenting the results of observations are illustrated by Figs. 3 to 4. Figure 3 represents the settlement of a raft foundation for three different stages of loadings. This raft foundation rests on about 20 ft of silt and fine, silty sand above fairly stiff clay of great depth. The top of the raft is about 10 ft below the original ground surface. Settlement observations were made during construction once every few weeks on 34 reference points, uniformly scattered over the raft. If the results of the observations were plotted in tables, very few engineers would have the patience to analyze them. Therefore it was decided to represent them by plotting curves of equal settlement.

In order to keep track of the rate of settlement, the settlement of several points was plotted against time. On account of the very unequal rate of loading, the diagrams merely showed that the settlement increased. However, when the settlement was plotted against the unit load on the raft, it was found that the settlement increased much less rapidly than this load.

Results of pressure gage measurements are represented graphically in Fig. 4. It indicates the hydrostatic-pressure conditions at the base of the clay stratum below the shipway floors shown in Fig. 2 (*a*). The piezometric elevations were determined by Bourdon gages. In Fig. 4 the observation points are indicated by small circles. If presented in tables, the results would merely show that the piezometric elevations vary considerably from point to point. However, when the data are used to plot curves of equal piezometric elevation, it is possible to see at a glance the intensity and distribution of the forces which tend to lift the clay stratum together with the shipway floors.

After the job is finished, no further digest is required because all the essentials are already contained in the small-scale graphs such as Figs. 3 and 4. To these graphs should be added a key plan, the condensed test boring records, a condensed account of all field tests, such as loading or pile-driving tests, and a few pages of text summarizing the field observations and the findings. All these together constitute the "digest" of the field records.

Engineers who make field observations are likely to be satisfied if they themselves are able to understand the records at the time they are made. But after a lapse of time, even they may be unable to understand the records. Hence, as soon as a record is received at the main office, it should be critically examined, preferably by someone who is not directly connected with the job. Thus defects in the method of keeping the records will be realized and can be eliminated without delay. If the data in a condensed record are obtained from field measurements by a method of computation which involves some assumption as, for instance, the case of computing the distribution of earth pressure on the sides of a cut on the basis of measured strut loads, the data on which the computation was based should appear on the same sheet with the graph.

After the job is finished, the condensed records should be prepared in duplicate. One should be filed away with the original field data. The other should be kept in a collection of condensed records. This second copy should be provided with all the references required for locating the original data without excessive loss of time

Engineers' Notebook

Ingenious Suggestions and Practical Data Useful in the Solution of a Variety of Engineering Problems

Transparent Scales Made from Photographic Film

By M. A. CHURCHILL, JUN. AM. SOC. C.E.
ASSOCIATE HYDRAULIC ENGINEER, TENNESSEE VALLEY AUTHORITY, KNOXVILLE, TENN.

IN connection with a study being made of wave heights and wind velocities on Wheeler Reservoir by the Hydraulic Data Division of the Tennessee Valley Authority, some device was needed for scaling individual wave heights directly from the continuous recorder charts on which every wave passing the wave station is recorded to a greatly reduced vertical scale. A sample of the wave-height chart, with scale superimposed, is shown in Fig. 1. The scale ratio of actual wave heights to recorded heights is 48 to 1. Any error in measuring wave heights from the charts is thus magnified 48 times. It is evident that the method and equipment used must be very accurate.

The device finally adopted was suggested by R. L. Campbell, Assistant Hydraulic Engineer. This device is a short, narrow strip of transparent photographic film on which the scaling lines are printed very accurately by a photographic process. To insure a high degree of accuracy, the scaling lines for measuring wave heights were first drawn on white drafting paper exactly four times the desired spacing and weight of the final lines. A photographic negative was made of this original drawing, which reduced the spacing to exactly that required for measuring wave heights on the recorder chart. To obtain the final positive film, which shows black lines on a transparent background, a contact print was made from the negative on photographic film. The result is a strip of film on which the scale lines are very fine, yet sharp and accurate.

In use, this film is moved along by hand directly on top of the recorder chart, as shown in Fig. 1. Wave heights are read directly from the scale graduation on the film. To avoid the possibility of losing the small pieces of transparent material among papers and charts on the engineer's desk, a small piece of red scotch tape is stuck on each end.

The same type of scaling device was developed for measuring the wind velocity directly, in miles per hour, from anemometer charts that indicate, by the spacing of consecutive offsets in the recorded ink line, the time required for the passage of each mile of wind.

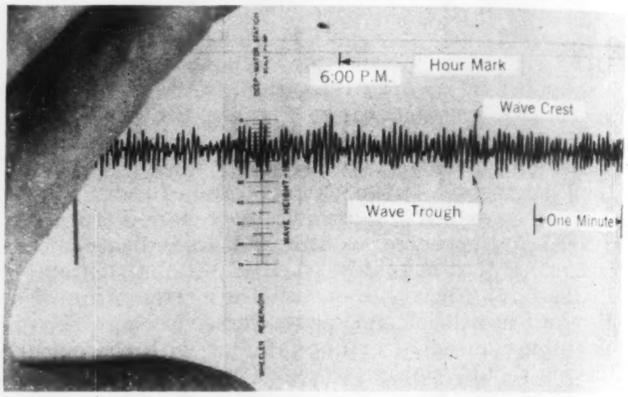


FIG. 1. TRANSPARENT SCALE IN USE ON A WAVE-HEIGHT RECORDER CHART

It has been found that the use of these film scales improves the accuracy of the abstracted record, and that eyestrain and nervous fatigue are reduced.

Short-Cut for Staking Cross Sections on Uniform Slopes

By ROBERT E. SIMPSON, JUN. AM. SOC. C.E.
ASSISTANT ENGINEER, PUBLIC ROADS ADMINISTRATION, ODGEN, UTAH

IN mountainous terrain it is both difficult and tedious to stake cross sections for a highway or for any other improvement, when the side hill is so steep that it becomes necessary to "break chain" or change "H.I.'s." If the terrain is of uniform slope, as is frequently the case, the following method is often expeditious.

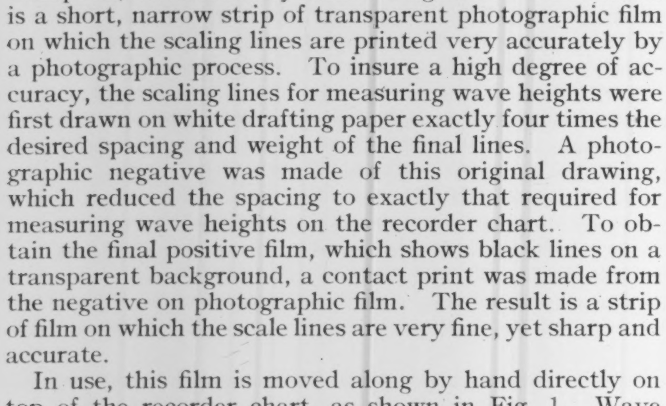


FIG. 1. HIGHWAY CROSS SECTION ON SLEEP SIDE HILL

It is assumed that the center-line stakes and grade elevations have been established. The slope of the ground can be established by an abney level, transit, or a Rhodes arc.

In Fig. 1, let r equal the crown or difference in elevation from the shoulder to center line; F, the fill or cut on center line; W or W_1, one-half of the roadway width; n or n_1, the slope ratio; X or X_1, the distance from center line to slope stake; and θ, the angle of the natural ground to horizontal. All dimensions are in feet.

If the section is in cut-and-fill, it follows from the right side of Fig. 1 that:

$$[X_1 \tan \theta - (F - r)]n_1 + W_1 = X_1$$

Simplifying,

$$X_1 = \frac{W_1 - (F - r)n_1}{1 - n_1 \tan\theta} \ldots\ldots\ldots (1)$$

If the section is in fill, as shown on the left side of Fig. 1, it follows that:

$$[(F - r) \pm X \tan\theta]n + W = X$$

Simplifying,

$$X = \frac{(F - r)n + W}{1 \pm n \tan\theta} \ldots\ldots\ldots\ldots (2)$$

Use minus $n \tan\theta$ for the down-hill distance from center line, or plus $n \tan\theta$ when the slope is uphill.

When X becomes less than W, the section extends into cut and Eq. 1 is applicable. Equations 1 and 2 are readily solved and eliminate the trial-and-error method. The slope distance may be chained and converted to a horizontal distance, or vice versa, depending on the instruments used and the distances needed. When the section is all in cut, which would be the reverse of fill, r becomes plus and Eq. 2 still holds.

Another advantage of the method is that it readily lends itself to the staking of culverts.

Our Readers Say—

In Comment on Papers, Society Affairs, and Related Professional Interests

Collective Bargaining for Engineers

Dear Sir: Hailed by *Time* magazine as the most momentous decision in the 91-year history of the American Society of Civil Engineers, the Board of Direction at its October meeting adopted the report of the Committee on Employment Conditions recommending the establishment of collective bargaining groups for civil engineers. The complete report was printed in the November issue of Civil Engineering. Preceding issues gave considerable background material demonstrating the necessity for engineers to organize effectively.

It is fortunate that the Society has a going organization of Local Sections because the Local Section is the key to collective bargaining for civil engineers. The Committee's report states, "In conformity with Federal Legislation, collective bargaining units must be local in character, although these locals may be affiliated with one another through a national coordinating agency." Organizing as legal collective bargaining units thus is something tangible and of prime importance for each Local Section to do. The responsibility for the success or failure of collective bargaining for civil engineers as a function of the American Society of Civil Engineers rests squarely on the shoulders of the Local Sections. The acceptance of this responsibility by the Local Sections is the next step.

The Tennessee Valley Section has taken this step. At its annual meeting, held on November 13, the Section adopted the amendment to the Local Sections Constitution in full accordance with the recommendation of the Board of Direction as expressed in the report of the Committee on Employment Conditions.

Highest commendation is due the Committee on Employment Conditions for its study of engineering employment, for the realism with which it has faced the facts in the situation, and for its constructive report with recommendations for specific action. In addition to its epoch-making character, this report attains a high standard in considering the interests of every member of the Society rather than the interests of only a special group.

A. S. Fry, M. Am. Soc. C.E.

Knoxville, Tenn.

Double Value Erroneously Given for Unit Bond

To the Editor: My attention has been directed by M. Hirschthal, M. Am. Soc. C.E., to an error that others also may have noticed in my paper, "Load Test of a Slab with All Bars Lapped," in the September issue of Civil Engineering (page 435). By a mistake which escaped my attention, unit bond was given at 319 lb per sq in., a value double that which should have been used.

Seattle, Wash. Homer M. Hadley, Assoc. M. Am. Soc. C.E.

Plans for Earth-Filled Dam at Sante Fe

To the Editor: In connection with my article on an "Earth-Filled Dam at Sante Fe, New Mexico," in the August issue, I would like to correct an unintended implication that the plans submitted by the firm of Sanderson and Porter to the Office of the State Engineer of New Mexico were inadequate.

I refer to the following two sentences in my article: "Examination of the plans for the dam resulted practically in the redesign of the structure. There are certain essential features which must be considered before such a design can be accepted as satisfactory."

It was the writer's intent in the original paper, of which the article in Civil Engineering was an abstracted version, to make the following statement: "Examination of the plans by the examining engineer amounts to practically designing the dam himself, for he must go through the plans in detail in order to be assured that the plans are adequate."

Joel N. Van Sant
Engineer of Dams and Reservoirs
Office of State Engineer
State of New Mexico

Santa Fe, N.Mex.

Comments on Nomenclature of Compression

To the Editor: In supplying additional experimental evidence on the compressive resistance that can be developed under certain conditions of lateral restraint, the reconnaissance data cited by Mr. Sowers, in his article in the August issue, constitute a contribution to engineering knowledge. However, he seems to have been somewhat drastic in designating the compressive resistance developed over a limited portion of an area, or the resistance developed by material under lateral restraint, as "pure compression," "pure compressive strength," "true compressive strength," "true crushing strength," and so on. There is, of course, no such thing as a "true or pure compressive strength," except as such a term might be accorded a special meaning through usage or be created by fiat or arbitrary definition.

The author correctly recognizes that the conventional compressive specimen of brittle material fails by shear. Moreover, he undoubtedly knows that the resistance developed over a given cross section, under conventional testing methods, may vary with the height of the specimen. A cube develops a higher resistance than a cylinder or other prism of a height equal to twice the least lateral dimension. A prism whose height is only half its least lateral dimension develops a much greater resistance than does the cube; the compressive strength of a sheet of paper, tested flat, is really quite high. Admittedly our conventional definition of compressive strength is arbitrary, and the values secured by test are valid only if the regulation specimen is used and the stipulated test procedure is followed.

The author apparently overlooks the fact that the ratio of loaded area to total area, in a particular case, is also bound to have an important effect on the value he gets for the "true compressive strength" of which he writes. If, for example, only the central 90% of the total area is loaded, the material may be expected to develop increased crushing resistance before the block splits or otherwise fails. If only 50% is loaded, the crushing resistance will be increased materially, and as a limiting case is approached the values for the resistance developed become relatively very high, as demonstrated by some of the author's data.

In his objection to the shear that is present in the case of the conventional compressive specimen, the author implies that there is no complicating shearing stress present under the conditions that he specifies for securing an indication of "true compressive strength." Shear is not, however, that easily eliminated. Under the case of a partially loaded area, shears will be present. For the limiting case of a finite area of load on an infinite area of surface, the failure will finally be by shear in the form of a "pop-out," since the failure will necessarily be local. An infinite area or member under localized loading could not fail in its entirety. The only possible case of compressive loading devoid of shear is that of equal tri-axial loading—that is, equal intensities of compressive stress applied simultaneously in the directions of any three mutually perpendicular axes.

Any measure of compressive strength secured from test is valid only for the conditions of the test and for the type of specimen employed. Rarely, if ever, will these conditions be identical with those of service. Thus the situation of the compressive fibers in a beam is different in a number of important respects from the situation within a compressive specimen. From the standpoint of logic, there is simply no one "true crushing strength" and, regardless of usage or definition, the data from tests need always to be interpreted and evaluated in terms of the conditions of expected use. Here is one of the important places where engineering judgment and factors of safety (ignorance) enter the picture.

The writer suggests that no attempt be made to define "true or pure compressive strength"; and that we continue to accept the results from established types of compressive specimens and tests as supplying that which we term "the compressive strength of a material." Where excess resistance can be developed safely under conditions of partial-area loading or any other form of lateral restraint, advantage should be taken of it. However, we should not be too hasty in attempting to alter an established nomenclature.

H. J. GILKEY, M. Am. Soc. C.E.
Head, Department of Theoretical and
Ames, Iowa *Applied Mechanics, Iowa State College*

Forum on Professional Relations with Corrections

It appears that the answers to current questions Nos. 14 and 15 have been unfortunately interchanged. Thus Dr. Mead's comment on Question No. 14, as printed in the November issue, should have been deferred to answer Question No. 15, to which it applied. To obviate possible further misunderstandings, questions and answers for both Nos. 14 and 15 are given here. "Question No. 14: An engineer in general practice was retained by a client to prepare plans, estimates, and specifications, and to inspect and superintend the construction of certain works. In this capacity the engineer became the interpreter and arbiter of the contract and specifications. The contractor who had taken the contract, realizing the experience and ability of the engineer in his specialty, desired to employ him at the same time on another project of a similar nature which he had in view. The engineer had ample time for both jobs. Should he have accepted or rejected the contractor's offer?"

Almost every engineer in general practice is obliged to serve many clients, as it is seldom that any job is large enough to demand his entire time or the expense of his entire services. When, as is usually the case, there is no antagonism between his clients' interests, there is seldom any resulting friction from such mutual employment. The engineer must be careful, therefore, not to accept clients with antagonistic interests. He should not accept as a client a contractor whose work he has or will have under his supervision, as no man is strong enough in character to be sure he can assure perfect equity to both parties under such conditions and, even if he were, he would probably be accused of unfairness under such circumstances.

"QUESTION NO. 15: *An engineer makes plans and writes specifications for an installation that is somewhat novel and unique. Is he justified in using essentially these same plans a second time, if no stipulation to the contrary has been made by the client for whom the first work was done and if no data supplied by the first client are used?"*

The client of an engineer, except by special agreement, has no proprietary right in the engineering plans for work which is being done and, unless otherwise specifically agreed, cannot use such plans the second time without additional compensation to the engineer who has produced them. The engineer therefore has a right to use such plans and details for other clients whenever he so desires.

It should be remembered, however, that the same plans in detail are seldom entirely satisfactory for any two locations and should therefore always be made with the conditions of the installation carefully in mind. In almost sixty years of engineering experience, the writer cannot remember that he ever used the same plans twice, although he has built many plants similar in nature. However, he has always found it necessary to make radical changes to fit the particular work for which the plans were made.

DANIEL W. MEAD, Past-President and
Madison, Wis. Hon. M. Am. Soc. C.E.

Problem 16, as given in the November number, will be answered in the next, or January, issue. Meanwhile, further discussions by members may be submitted. Next in the series the following is announced, for which replies may be received until January 5, with answers in the February issue.

PROBLEM NO. 17: *Assume, as an engineer, you have spent some years in contracting, have practically retired from that business, have established an office in a large city, and have begun practice as a consulting engineer. You have been employed by a small city to design a sewer system. You have estimated the cost of the system at $62,000, including a discount of $4,000 on the special assessment script which is to be issued in payment for the work. This discount has been quoted to you by a banker who has been buying and selling such securities.*

The mayor says to you: "You have had experience in contracting. Why don't you take this work at your own estimate? We have confidence in your ability to do a good job, and we know your estimate was made without any knowledge that you might be asked to do the work; it is therefore fair." (You are to assume that, at the time the question was asked you, the letting of the contract to you by unanimous vote of the city council would be a perfectly legal matter.)

You answer: "If you can get someone else to take my place as your engineer, and I can arrange to finance the work, I might be interested in taking the contract at my estimate." You then see the banker who has agreed to take the paper at the discount named, and he agrees to see the city officials and inquire concerning their time of issue and validity.

A few days later, the banker sends for you and says: "We have decided to take this paper but will have to charge you a larger discount. You know the mayor and the city council do not get paid for all the extra work involved by this contract, and I believe that you will agree they should have some consideration. We have arranged for you to get the contract for $68,000 and will charge you a discount of $10,000. This will leave you whole and will make it possible for me to take care of the mayor and council without cutting into your profit. We will take care of all the arrangements so that you will not need to give it another thought."

Do you feel certain or doubtful as to your answer to the banker? What would your answer be, and why?

SOCIETY AFFAIRS

Official and Semi-Official

Plan Now for the Ninety-First Annual Meeting

Technical and Social Events in New York Are Scheduled for January 19–21

War and Postwar engineering matters will highlight the technical program now being arranged for the Ninety-First Annual Meeting of the Society. The sessions will be held in New York beginning Wednesday, January 19, 1944, and continuing through Friday, January 21. The business and technical meetings will be held in the Engineering Societies Building, 33 West 39th Street. Arrangements have also been made for a limited number of social events, which will occupy the noon and evening hours. A full program of the meeting will be presented in the January 1944 issue of Civil Engineering.

The Annual Meeting will open with a general business session on Wednesday morning. During this time the annual report on Society activities for 1943 will be given, Society prizes will be awarded, and Honorary Memberships will be conferred. Newly elected officers will be inducted at that time. Winners of prizes and awards have been selected and many of them will be present to receive their awards in person. This year, the prizes will include:

Norman Medal
J. James R. Croes Medal
Thomas Fitch Rowland Prize
James Laurie Prize
Collingwood Prize for Juniors
Arthur M. Wellington Prize
Rudolph Hering Medal
Construction Engineering Prize
Karl Emil Hilgard Prize

Honorary Membership in the Society is to be conferred on four distinguished civil engineers. Those elected for this honor are Edward H. Connor of Leavenworth, Kans., vice-president of the Missouri Valley Bridge and Iron Company; Francis T. Crowe, general superintendent of construction on Shasta Dam, Calif.; Thomas H. MacDonald, of Washington, D.C., director of the Public Roads Administration; and Gerard H. Matthes, director of the U.S. Waterways Experiment Station at Vicksburg, Miss.

Also at this session tellers will report on the canvass of ballots for the newly elected officers. Following the induction of officers, the meeting will adjourn for luncheon, which will be served at the Commodore Hotel, Lexington Avenue and 42d Street.

Technical Program

Beginning Wednesday afternoon and continuing until the end of the meeting, a number of technical meetings will be held. A condensed schedule follows:

Wednesday Afternoon, January 19

City Planning and Structural Divisions

Thursday Morning, January 20

Hydraulics and Sanitary Engineering Divisions

Thursday Afternoon

Hydraulics, Sanitary Engineering, and Construction Divisions

Friday Morning, January 21

Power, Soil Mechanics, and Surveying and Mapping Divisions

Friday Afternoon

Power, Soil Mechanics, and Highway Divisions

These programs have been prepared under the guidance of Division executive committees or subcommittees, and all details, including subjects and authors of papers, will be given in the January issue. Members of the Sanitary Engineering Division will participate in the sessions of the New York Sewage Works Association on Friday.

Social Events

On Wednesday night, January 19, the annual dinner, reception, and dance will be held in the Grand Ballroom of the Hotel Commodore. Thursday evening, the annual Smoker will be held, also at the Commodore Hotel. It will begin at 6:30 p.m. with dinner for members and men guests, and will be followed by unusual entertainment from 8:30 to 9:30. Ladies are to be invited to the entertainment following the dinner.

Many college reunions will be held during the week. Special arrangements have been made for the convenience of alumni groups who wish to plan such a reunion dinner for Thursday night. Private dining rooms and special tables may be reserved at the Smoker. The regular Smoker ticket will cover the expense of the special accommodations.

Several special features in the way of entertainment for the ladies are being planned.

Make Reservations Early

The hotel situation in New York is acute. Therefore members and guests should make reservations for accommodations at their earliest convenience. Current room rates at leading hotels are listed below. Visitors cannot expect to obtain hotel accommodations in the city unless they have confirmation of their reservations before leaving home.

The Commodore Hotel at the corner of Lexington Avenue and 42d Street will be the official headquarters hotel for the meeting. The management has agreed to hold a sufficient number of rooms for the Society so that anyone reserving a room there before December 20, 1943, will be accommodated. Members wishing to stay at the Commodore during the meeting must write for rooms before December 20 and mention the Society meeting.

Transportation agencies also request that reservations for accommodations be made at the earliest possible moment. With its first session in the middle of the week, the Annual Meeting will make traveling to New York somewhat easier—in that the week-end peak may be avoided. It is nevertheless essential that arrangements for the trip be made at an early date.

Hotel Rates

Hotels	Location	Single Room	Double Room
Commodore	Lexington Ave. & 42d St.	$3.50 up	$ 5.50 up
Astor	Broadway and 44th St.	3.00 up	5.00 up
Barclay	111 East 48th St.	6.00 up	8.00 up
Biltmore	Madison Ave. & 43d St.	5.50 up	9.00 up
Chatham	Vanderbilt Ave. & 48th St.	5.00 up	7.00 up
Claridge	Broadway & 44th St.	3.50 up	5.00 up
Edison	228 West 47th St.	3.25 up	5.00 up
Governor Clinton	Seventh Ave. & 31st St.	3.30 up	4.40 up
Lexington	Lexington Ave. & 48th St.	4.00 up	6.00 up
McAlpin	Broadway & 34th St.	3.30 up	4.95 up
Murray Hill	112 Park Ave.	4.00 up	5.00 up
New Yorker	Eight Ave. & 34th St.	3.85 up	5.50 up
Park Central	Seventh Ave. & 55th St.	5.00 up	7.00 up
Pennsylvania	Seventh Ave. & 33d St.	3.85 up	5.50 up
Pierre	Fifth Ave. & 61st St.	7.00 up	9.00 up
Plaza	Fifth Ave. & 59th St.	6.00 up	8.00 up
Roosevelt	Madison Ave. & 45th St.	4.50 up	6.50 up
Savoy-Plaza	Fifth Ave. & 59th St.	6.00 up	8.00 up
Taft	Seventh Ave. & 50th St.	3.00 up	5.00 up
Vanderbilt	Park Ave. & 34th St.	3.00 up	6.00 up
Waldorf-Astoria	Park Ave. & 50th St.	7.00 up	10.00 up
Woodward	Broadway & 55th St.	3.00 up	4.00 up

Manual on Collective Bargaining

An analysis of federal labor laws, which should prove valuable to engineers actively interested in their own relationship with collective bargaining, has been published under instructions from the Board of Direction of the Society. The manual, entitled "The Engineer and Collective Bargaining," is an assembly of information regarding bargaining procedures gathered for the Board by Howard F. Peckworth, Assistant to the Secretary. The manual was prepared originally as a report for presentation to the Board of Direction at the Dallas, Tex., meeting in early 1943. Subsequently it has been enlarged and revised, and was approved and ordered printed by the Board at its meeting in Los Angeles, Calif., last July.

Laws under which collective bargaining has grown and cases and rulings arising from their enforcement are commented upon. The specific restraints placed upon employers and the privileges extended to employees by these enactments, as well as rulings in interpretation of these laws, are set forth.

The manual has not been prepared for employee engineers alone. Employers have been at a disadvantage in collective bargaining because they have been slow to realize the implications of recent labor legislation. The manual informs them of their rights as granted under law so that they may recognize the balance of relative interests of employers and employees.

Mr. Peckworth's concluding statement is: "In the preparation of this Manual, it has not been intended to do other than to describe the significance of labor legislation, its interpretations, requirements, opportunities, limitations, and trends as related to both engineering employees and engineering employers, without prejudice to either. However, it probably reflects a considerable degree of sympathy for the acceptance of an obligation to assist engineering employees in their economic relations with employers."

This manual No. 26 will be mailed only to Local Section officers and members who specially desire it. Those who are interested should consult with their Local Section officers or request a copy from Headquarters.

Professional Records of Nominees

Brief Biographical Sketches of Candidates for Society Offices

MALCOLM PIRNIE

MALCOLM PIRNIE was born in New York City in 1889, but was soon taken to Springfield, Mass., where he prepared for college in the public schools. He received the degrees of bachelor of science from Harvard College in 1910, and of master in civil engineering from the Graduate School of Applied Science of Harvard University in 1911.

From that time until 1916, Mr. Pirnie was assistant engineer with the firm of Hazen and Whipple in New York. He then became a partner in the firm, the name of which was later changed to Hazen, Everett and Pirnie. Since June 1929, he has been in private practice in New York.

MALCOLM PIRNIE
Official Nominee for President

He is a Member of the American Society of Civil Engineers, of which he was Director from 1928 to 1930 and Vice-President in 1938 and 1939. He was a member of the Committee on Publications at the time that CIVIL ENGINEERING was started. In 1932 he served as president of the Metropolitan Section. As a member of the American Water Works Association, he has served as director and president and is chairman of its Water Works Practice Committee. In addition, he is a member of the American Institute of Consulting Engineers, New England Water Works Association, Florida Engineering Society, Society of Military Engineers, American Geophysical Union (Section of Hydrology), and a fellow of the American Public Health Association. He is adviser of the General Assembly of the Construction League of the United States, is registered with the National Council of State Boards of Engineering Examiners, and is an official arbitrator of the American Arbitration Association.

Mr. Pirnie's professional experience has been distributed over twenty states, parts of Canada, Russia, France, South America, and the Caribbean, dealing with problems in sanitary engineering. In 1917 he was sent to Russia as assistant sanitary engineer with the American Red Cross Commission, and in 1918 and 1919 served in France, with the rank of captain, as assistant engineer of water supply under the Director General of Transportation.

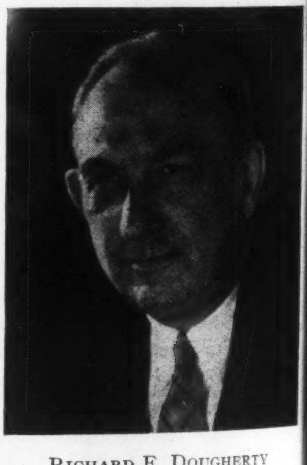
During the depression Mr. Pirnie served as chairman of the Plans Committee and of the Construction Legislation Committee of the Professional Engineers' Committee on Unemployment; as chairman of the Public Works Committee of the American Society of Civil Engineers; as deputy administrator of the NRA in charge of codes for the construction industry; and as a member of the Engineering Technical Board of Review for the PWA.

For the federal government, he has served as consulting engineer to the Corps of Engineers, U.S. Army, on the ground-water resources of Florida, and as water consultant to the National Resources Board. He has contributed articles and papers on a variety of subjects to the official publications of various engineering societies and to many technical publications.

RICHARD ERWIN DOUGHERTY

RICHARD ERWIN DOUGHERTY was born in New York City on February 13, 1880. He attended the College of the City of New York for three years and Columbia University for four years, graduating from the latter with the degree of C.E. in 1901. In 1901 and 1902 he was an instructor in the department of civil engineering at Columbia and in the Columbia summer schools of geodesy and surveying.

Since 1902 Mr. Dougherty has been in the service of the New York Central System. From 1902 to 1904 he was rodman, transitman, and assistant engineer on construction work, Mohawk Division; 1904 to 1905, assistant engineer, New York office; and from 1905 to 1918, in charge of construction, Eastern District, comprising the Hudson, Harlem, and Putnam Divisions and New York Harbor—as resident engineer 1905 to 1907, assistant district engineer 1907 to 1910, and district engineer from 1910 to 1918. From 1918 to 1924, he was designing engineer, Buffalo and East; from 1924 to 1926, engineering assistant to vice-president in charge of operation, New York Central Railroad (including Ohio Central lines), and from 1926 to 1930, engineering assistant to president, New York Central Lines, including subsidiaries. He was elected vice-president, improvements and development, New York Central System, February 1, 1930.



RICHARD E. DOUGHERTY
Nominee for Vice-President, Zone I

As vice-president, Mr. Dougherty has supervision over engineering and maintenance-of-way activities, real estate transactions, valuation, insurance, and development. His duties include supervision over Grand Central Terminal real estate, including office buildings, apartment houses, and hotels. He is chairman of the Research Council of the New York Central System for consideration of postwar problems. He is vice-president of forty-one of the railroad and real estate subsidiary companies of the New York Central System, and director of twenty-two subsidiary companies.

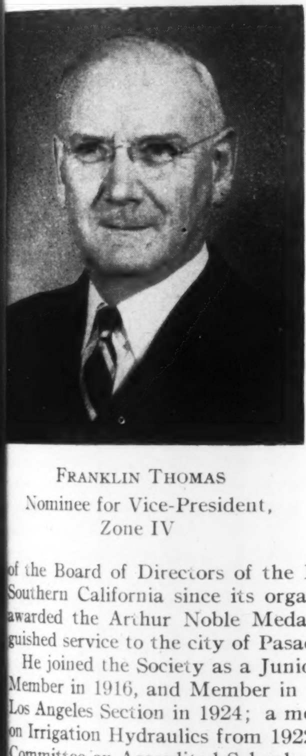
Elected a Junior in the Society in 1903 and Member in 1912, Mr. Dougherty served as Director from 1927 to 1930. His other affiliations include membership in the American Railway Engineering Association and the New York State Society of Professional Engineers and Land Surveyors. He is also a member of the Committee for Study of Transportation, appointed by the Association of American Railroads to consider postwar problems. Since 1935 he has been chairman of the Grade Crossing Committee of the Association of American Railroads, acting for all the railroads in cooperation with the Public Roads Administration. And he is also chairman of the Executive and Operating Committees of the Associated Railroads of New York State (handling legislative questions).

Long interested in civic affairs, Mr. Dougherty is a member of Mayor LaGuardia's Business Advisory Committee and Committee on Port and Terminals, New York City, and first vice-president of the West Side Association of Commerce of the City of New York. He is also a member of the White Plains (N.Y.) Postwar Planning Commission, the New York Railroad Club, the Traffic Club of New York, and Tau Beta Pi (honorary, Columbia University). A former member of the White Plains Board of Education, he served as president from 1923 to 1935.

FRANKLIN THOMAS

FRANKLIN THOMAS was born near Red Oak, Iowa, on May 19, 1885. He graduated from the University of Iowa in 1908 with a B.E. degree, and spent the following year at McGill University doing graduate work. In 1913 the University of Iowa granted him the C.E. degree. Between 1909 and 1913 he was, successively, construction foreman for one year with the Mines Power Company at Cobalt, Ontario; instructor for two years in the department of engineering at the University of Michigan; and designer for one year for the Alabama Power Company.

In 1913 he went to the California Institute of Technology as associate professor of civil engineering to develop that department. In 1915 he became professor of civil engineering, and during 1917 and from 1920 to 1921 he served as chairman of the administrative committee of the faculty during the absence of the president. In 1918 he was commissioned first lieutenant, Engineer Corps Reserve. In 1919, while on leave of absence from the Institute, he held an appointment as assistant engineer for the U.S. Bureau of Reclamation. Since 1924 he has been chairman of the Division of Civil and Mechanical Engineering, Aeronautics and Meteorology, at the California Institute of Technology.



FRANKLIN THOMAS
Nominee for Vice-President, Zone IV

Professor Thomas served as a member and vice-chairman of the Board of Directors of the City of Pasadena from 1921 to 1927; as president of the Pasadena Chamber of Commerce in 1927; as president of the Pasadena Community Chest in 1928; and as president of the Pasadena Civic Orchestra Association from 1929 to 1931. Professor Thomas has been a member and vice-chairman of the Board of Directors of the Metropolitan Water District of Southern California since its organization in 1928. And he was awarded the Arthur Noble Medal for the year 1939 for distinguished service to the city of Pasadena.

He joined the Society as a Junior in 1912, became an Associate Member in 1916, and Member in 1923. He was president of the Los Angeles Section in 1924; a member of the special Committee on Irrigation Hydraulics from 1922 to 1933; and chairman of the Committee on Accredited Schools in 1937. He also served as Director of the Society from District 11 from 1930 to 1933.

His other affiliations include membership in Sigma Tau, Tau Beta Pi, Sigma Xi, the American Water Works Association, the California Sewage Works Association, and the Society for the Promotion of Engineering Education.

SOLOMON CADY HOLLISTER

SOLOMON CADY HOLLISTER was born in Crystal Falls, Mich., on August 4, 1891. He attended the State College of Washington for three years and received the degree of B.S. in C.E. from the University of Wisconsin in 1916, and the degree of C.E. in 1932 from the same institution. In 1942 he was awarded the honorary degree of doctor of engineering by Stevens Institute of Technology.

He served one year as instructor in mechanics at the University of Illinois and six months as research engineer for the Corrugated Bar Company of Buffalo on tests of flat-slab construction. From 1918 to 1920 he was associated with the Concrete Ship Section of the Emergency Fleet Corporation, successively as chief designing engineer, in charge of barge construction, and head of the investigating branch.

S. C. HOLLISTER
Nominee for Director, District 3

From 1920 to 1930 Dean Hollister maintained a consulting practice in Philadelphia, specializing in industrial management and appraisals, building construction, concrete bridge construction, and strengthening of steel highway and railway bridges by arc welding. In 1930 he was appointed professor of structural engineering at Purdue University, and four years later became director of the School of Civil Engineering at Cornell University. In 1937 he was appointed dean of the College of Engineering and director of the Engineering Experiment Station at Cornell, which positions he still holds.

In 1931 and 1932 he conducted extensive researches into the quality of concrete from transit mixers, and from the latter year to 1936 he was consultant to the Babcock and Wilcox Company on the design and construction of the 30-ft penstocks at Boulder Dam. This work involved mathematical stress analyses, model tests, and photoelastic investigations. He has served the U.S. Engineer Department as consultant on testing methods and devices in soil mechanics, and the U.S. Maritime Commission as consultant on the design and construction of concrete ships.

From 1920 to 1924 and from 1930 to 1940 Dean Hollister was a member of the Joint Committee on Standard Specifications for Concrete and Reinforced Concrete and chairman of its subcommittee on design. He has contributed technical articles to journals and is the author of books on structural engineering and materials testing.

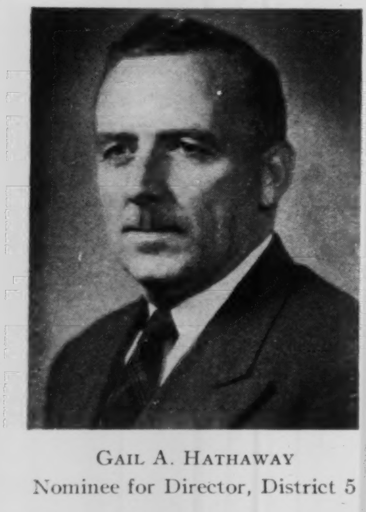
He joined the Society in 1919 and has served as secretary of the Philadelphia Section, first president of the Indiana Section, president of the Ithaca Section, and as a member of the executive committee of the Structural Division. His other affiliations include membership in the American Society of Mechanical Engineers, the American Railway Engineering Association, the American Welding Society, and the International Association of Bridge and Structural Engineers.

GAIL A. HATHAWAY

GAIL A. HATHAWAY was born near Menomonie, in Dunn County, Wis., on October 11, 1895. He received his early education in the public schools of Oregon and entered Oregon State College in 1914. When the United States declared war in 1917, Mr. Hathaway enlisted in the 3d Coast Artillery Regiment of the Oregon National Guard. He served in the Coast Artillery in this country and with the 65th Regiment, Army Artillery Corps, in France. Returning from France with the rank of 2d lieutenant in the spring of 1919, he reentered Oregon State College and received a B.S. degree in civil engineering in 1922.

From March 1922 to October 1924 Mr. Hathaway was employed in Oregon on canal location and topographic surveys and as construction engineer on dam and canal construction for irrigation projects. From November 1924 to December 1928 he was assistant to the State Engineer of Oregon, resigning to accept a position as hydraulic engineer with the Kansas City District Office of the U.S. Engineer Department. He remained in the Kansas City District Office from 1928 to 1933 and was in the Missouri River Division Office at Kansas City, Mo., from 1934 to 1937. While Mr. Hathaway was with the Missouri River Division, he was engaged on the hydraulic design of Fort Peck Dam and served as consultant to the Engineer Department on hydrological and meteorological studies for other large dams in the Mississippi

River basin. Since 1938 he has been in the Office of the Chief of Engineers, U.S. War Department, as chief of the Reservoir Operation and Hydrology Section, Engineering Division, which is engaged on the hydraulic, hydrological, and meteorological phases of flood control and river and harbor projects as well as the establishment of criteria for the operation of flood control and multiple-purpose reservoirs.



GAIL A. HATHAWAY
Nominee for Director, District 5

During the past eight years Mr. Hathaway has been active in sponsoring meteorologic studies of flood-producing storms. With E. J. Minser, he is co-author of "Synoptic Analysis of Some Excessive Rainfalls in the Mississippi Basin, Due to Squeezing of Tropical Air Masses," which was published by the American Meteorological Society in 1938. He is also author of "Estimating Maximum Flood Flow for the Design of Protective Works" (1939 Transactions, A.G.U.); "The Importance of Meteorological Studies in the Design of Flood Control Structures" (American Meteorological Society, June 1939); and "Application of Hydrology to Flood Control" (Proceedings of the Pennsylvania State College Hydrology Conference, June 1941).

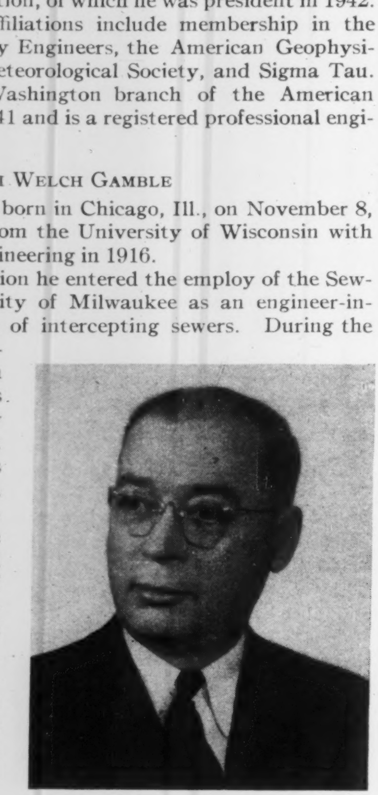
Elected a member of the Society in 1934, Mr. Hathaway has been serving on the Hydrology Committee, Hydraulics Division, from 1941 to 1943, and on the Society's Committee on Employment Conditions in 1943. For several years he has been active in the District of Columbia Section, of which he was president in 1942.

His other professional affiliations include membership in the Society of American Military Engineers, the American Geophysical Union, the American Meteorological Society, and Sigma Tau. He was president of the Washington branch of the American Meteorological Society in 1941 and is a registered professional engineer in the state of Oregon.

RALEIGH WELCH GAMBLE

RALEIGH W. GAMBLE was born in Chicago, Ill., on November 8, 1892. He was graduated from the University of Wisconsin with the degree of B.S. in civil engineering in 1916.

Immediately after graduation he entered the employ of the Sewerage Commission of the City of Milwaukee as an engineer-inspector on the construction of intercepting sewers. During the seven years that he was connected with this organization he, successively, held various engineering positions, finally becoming division engineer. Most of his work during this period was in connection with the construction of the intercepting sewer system, the reclamation of the disposal plant site from the bottom of Lake Michigan, and the construction of the activated sludge disposal plant. Mr. Gamble then became an engineer with the Wenzel and Henoch Company, public works contractors, engaged in extensive sewer and tunnel construction.



RALEIGH W. GAMBLE
Nominee for Director, District 7

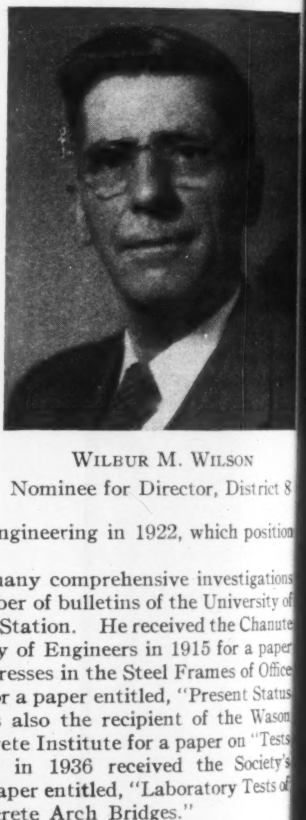
He was appointed superintendent of the Bureau of Street Construction and Repairs for the City of Milwaukee in 1924 at the outset of a large public-improvement program, which nearly doubled the area of the city in the following five years. The engineering personnel of the construction division of the Bureau was increased to supervise an annual contract paving program of $5,000,000; the repair division was expanded and modernized with a new asphalt plant and incidental equipment; a materials laboratory was established and staffed; and the largest quarry operation in the state was developed to produce paving aggregates.

Elected an Associate Member of the Society in 1924 and a Member in 1935, Mr. Gamble served as president of the Wisconsin Section in 1934. He is a former trustee of the Engineering Society of Wisconsin; a member of the Association of Asphalt Paving Technologists; and for the past four terms has been president of the Municipal Division of the American Road Builders' Association. He is a registered professional engineer in the state of Wisconsin.

WILBUR M. WILSON

WILBUR M. WILSON was born on a farm near West Liberty, Iowa, on July 6, 1881. He received the degree of B.M.E. from Iowa State College in 1900, and the professional degree of C.E. from the same institution in 1914. From 1901 until June 1903 he served as an instructor in mechanical engineering at his alma mater. He was then appointed to a graduate fellowship in Sibley College, Cornell University, for the school year, 1903–1904, receiving the degree of M.M.E. From 1904 to 1907 he taught at Iowa State College, and from 1907 to 1913 he worked in Chicago as a structural detailer and designer.

In the latter year he was appointed assistant professor of structural engineering at the University of Illinois. He remained in that capacity until May 1917, when he entered the first officers' training camp and was commissioned captain, E.O.R.C. He served with troops until the spring of 1918, when he was assigned to the U.S. Shipping Board and did experimental work for the Concrete Ship Section. Later he was commissioned a major in the E.O.R.C. and served as government representative in charge of a yard building concrete ships at Wilmington, N.C. Upon his discharge from the army in December 1918, he retained his commission as a reserve officer, finally being advanced to the rank of colonel, E.O.R.C. Returning to the University of Illinois in September 1919 as associate professor of structural engineering, he was made research professor of structural engineering in 1922, which position he still holds.



WILBUR M. WILSON
Nominee for Director, District 8

Professor Wilson has made many comprehensive investigations and is the author of a large number of bulletins of the University of Illinois Engineering Experiment Station. He received the Chanute Medal from the Western Society of Engineers in 1915 for a paper on the "Analysis of the Wind Stresses in the Steel Frames of Office Buildings" and, again, in 1937 for a paper entitled, "Present Status of Structural Welding." He is also the recipient of the Wason Medal from the American Concrete Institute for a paper on "Tests of Rigid Frame Bridges," and in 1936 received the Society's J. James R. Croes Medal for a paper entitled, "Laboratory Tests of Multiple-Span Reinforced Concrete Arch Bridges."

Elected a Member of the Society in 1922, Professor Wilson has been secretary and chairman of the executive committee of the Structural Section; president of the Central Illinois Section; and member and chairman of a number of the Society's technical committees.

His other affiliations include membership in the American Railway Engineering Association, the American Society for Testing Materials, the American Concrete Institute, the American Welding Society, the American Association for the Advancement of Science, the Society for the Promotion of Engineering Education, the Illinois Society of Engineers, the Western Society of Engineers, and the International Association for Bridge and Structural Engineering. For many years he has been a member of the Illinois Examining Committee for Registering Structural Engineers.

Professor Wilson received the honorary degree of doctor of engineering from Iowa State College in 1942.

Frank Clifton Tolles

Frank Clifton Tolles was born in New York on November 5, 1882. He received his secondary education in the public schools of Brooklyn and was graduated from the College of Civil Engineering at Cornell University in 1905, with the degree of C.E.

Professionally, Mr. Tolles has been engaged chiefly in the field of municipal engineering. He was successively in the employ of Waring, Chapman and Farquhar, of New York; C. H. Nichols, of New Haven, Conn.; the New York State Engineer; the Commissioners of Sewerage at Louisville, Ky.; and the U.S. War Department at Louisville.

In 1912 Mr. Tolles was appointed assistant engineer of sewer designs for the City of Cincinnati. Following this were engagements as district engineer for the International Joint Commission; assistant engineer with the late R. Winthrop Pratt; and superintendent of public works for the City of Akron. During the first World War he enlisted in the 112th Engineers, 37th Division. He was promoted through the grades to the rank of captain and saw active service in that capacity and as regimental topographic officer.

Frank Clifton Tolles
Nominee for Director, District 9

Mr. Tolles opened his own office for the practice of engineering in 1922, but shortly thereafter joined the organization of the late George B. Gascoigne, later becoming an associate of Gascoigne and Associates. He is now a partner in Havens and Emerson, as the firm was named after the death of Mr. Gascoigne. In his practice as consulting engineer, Mr. Tolles has been identified with sanitation projects in Cleveland, Buffalo, Philadelphia, and Cincinnati, and with other public and private clients. During the first two years of the present war, he served as partner representative on his firm's undertakings of cantonment and allied construction at Fort Knox, Ky., and at the Basic Flying School, Walnut Ridge, Ark. Currently he is a member of the Technical Advisory Committee, Ohio State Council of Defense.

He became a Junior in the American Society of Civil Engineers in 1910, Associate Member in 1912, and Member in 1921. He has served the Cleveland Section in various capacities, and was president in 1939. Mr. Tolles is also a former president of the Cleveland Society of Professional Engineers, and has membership in the American Water Works Association, the National Society of Professional Engineers, the Ohio Conference on Sewage Treatment, the Society of American Military Engineers, the American Legion, the City Club, the Citizens' League, and the Cleveland Chamber of Commerce. He is registered in Pennsylvania, Ohio, New York, Indiana, and Tennessee.

William D. Shannon

William D. Shannon was born in Parkville (Brooklyn), N Y., on June 28, 1881. Spending his early life in southern Michigan, he was graduated from the University of Michigan in June 1907, with the degree of bachelor of science in civil engineering. Prior to graduation he spent three years in the state of Washington teaching school and working, during the summers, on construction projects.

In July 1907 he joined the engineering staff of the Detroit River Tunnel Company, resigning in 1909 to return to the Pacific Northwest. In 1910 he entered the employ of the Stone and Webster Engineering Corporation as field engineer on the White River hydroelectric development in Washington, completing the project as superintendent. Then followed a series of engagements, which included the Big Creek and Caribou hydroelectric projects and the Snow Mountain Water and Power Company's project—all in California. On the latter two projects he was general superintendent in charge of construction.

During the first World War, Mr. Shannon was engaged in the construction of a housing project at Youngstown, Ohio, for the Carnegie Steel Company, and later was chief inspector of hull fabrication at the Hog Island shipyards in Philadelphia. After the war, he returned to the Pacific Coast to resume engineering and construction work.

Beginning in 1923, he served as project manager on a series of large projects, including the Baker River hydroelectric project, the Shuffleton steam plant, the Rock Island hydroelectric project, some 300 miles of high voltage transmission lines, and a number of primary substations. Since 1932 he has been engaged in private engineering and property management. In August 1941 he organized the offices of the War Production Board in the Northwest, and served as district manager till February 1943.

William D. Shannon
Nominee for Director, District 12

Mr. Shannon joined the Society as an Associate Member in 1911 and became a full member in 1918. He served as vice-president and then president (1942) of the Seattle Section, and for three years was chairman of the local membership committee. He served on the National Construction Division Committee in 1930, and is at present a member of the Columbia University Scholarship Committee. Mr. Shannon is a member of the Michigan Chapter of Sigma Xi, and a registered professional engineer in the state of Washington.

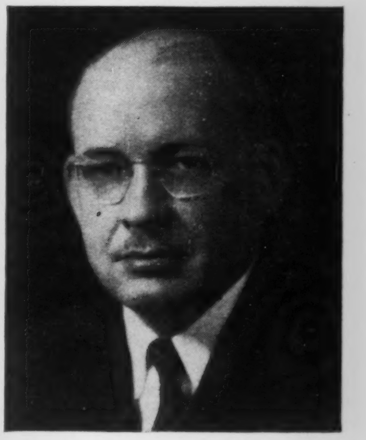
He has taken an active interest in civic affairs in his home city of Seattle, serving as a director of the Community Fund, and president of the Municipal League and of the Seattle Area Boy Scouts of America.

Royce J. Tipton

Royce J. Tipton was born at Litchfield, Ill., on March 23, 1893. He received his common school education at Cripple Creek, Colo., and his technical education at the University of Colorado, from which he has received a degree in civil engineering. During the first World War he served for two years in the Corps of Engineers—for part of this period overseas with the A.E.F. After being discharged from the army he was chief engineer for the San Luis Land and Mining Company until the fall of 1922, when he entered private practice in the San Luis Valley in Colorado.

During the year 1928 Mr. Tipton was designing engineer for the J. G. White Engineering Corporation on the Rio Mante reclamation project in Mexico. On his return to the United States he made special water supply studies on the Boulder Dam Project for the U.S. Bureau of Reclamation, and from September 1929 to the latter part of 1933 was special engineer for the State of Colorado on interstate water problems and studies of water resources.

Since 1933 he has maintained a general consulting practice in Denver. Projects with which he has been identified include the Independence Pass, Colorado-Big Thompson, and Willimas Fork transmountain diversions; Ralston Creek Dam and other features of the Moffat Tunnel transmountain diversion project; Federal Project No. 5 on the Lower Rio Grande; and the San Luis Project on the Upper Rio Grande. He has been identified with a number of the interstate water problems in the intermountain region, and was a member and, later, chairman of the consulting board that directed the Pecos River Joint Investigation sponsored by the


Royce J. Tipton
Nominee for Director, District 16

National Resources Planning Board. He has also served on several boards for the International Boundary Commission, and for the State of Colorado, and is at present consultant for the Bureau of Reclamation in connection with certain water controversies in the Salt River valley in Arizona.

Mr. Tipton has acted as architect-engineer for the War Department on several defense and war projects—including a replacement center, a small-arms munitions plant, a bomb-loading plant, and an airbase—and has also made reconnaissance surveys for the War Department for five cantonment sites.

Elected to associate membership in the Society in 1922 and to membership in 1941, Mr. Tipton is past-president of the Colorado Section. He has also served as a member of the executive committee of the Irrigation Division and, at present, is a member of the executive committee of the Power Division. He is chairman of the Irrigation Division's Committee on Capacity of Irrigated Lands to Pay Irrigation Costs, and of its joint (with the Engineering-Economics Division) Committee on Cost Allocation for Multiple Purpose Water Projects. Mr. Tipton's other technical affiliations include the Colorado Society of Engineers, of which he is a former president.

Five Thousand Members in Armed Services

Tabulation Indicates That Nearly 26% of Membership Is Now in Uniform

THE ARMED services have claimed the efforts of nearly 26% of the membership of the American Society of Civil Engineers as is shown by returns of the 1943 War Registry.

A questionnaire was mailed to 18,811 of those who were on the membership rolls on September 15, 1943. Of this number, 12,998 replies have been received, 69% of the total mailed, and it is from this number that the analysis has been made. If the experience of this year's registry follows that of 1942, late returns will change the balance somewhat, for a large number of the late returns in 1942 were from men overseas who are hard to reach, or who find it hard to reply, by mail. This number will doubtless be even greater this year. Last year at this time 73% of the total cards mailed had been returned in comparison to the 69% received thus far in 1943. It is reasonable to assume that the difference is due to the wider dispersion of service men around the globe and the resulting longer mail supply lines.

Returns, as tabulated November 19, also show that more than 28% of the Society's membership is engaged on war construction—13.5% in war industry and 19% employed by government war agencies. These percentages of members of the Society engaged in construction, industry, and in governmental agencies may not properly be added together, since a fair percentage of the returns indicated a member to be working in all three of these activities. Such is the case of one engaged by a government agency on the construction of an industrial plant. The percentage figure for construction seems to be absolute, as is also the figure for engagement in governmental agencies. The figure indicated as having relation to industrial plants must be considered doubtful.

The surprise of the registry has been the very small number who placed a check in the "unemployed" box. Despite expectations, only 119, or nine-tenths of 1%, of the returns registered as unemployed. Probably, at nearly any time, at least 119 men would be in the process of changing jobs. Therefore this unemployment is probably of only a temporary nature. Another 205 men listed themselves as retired.

An analysis of the number indicating unemployment has shown that the great majority are over the age of 50. Of the 119 total, 102 are over the age of 50 while only 17 are under that age. It is therefore probable that many factors, such as health, enter into consideration of the problem facing the 119 unemployed over age 50.

Returns from service men overseas understandably have been coming in slowly. On the 19th of November, 1,113 had been received. In this number are included many whose replies were returned by relatives or friends. Of the men in service, 93% are shown to be commissioned officers while 7% are "non-coms." In 1942, of the men in uniform, 94% were commissioned. This figure has decreased, but only by 1%, in 1943. The Navy claimed 4.5% of the total membership in 1942 and 9.7% in 1943, more than double, while the Army had 12.2% in 1942 and 16.2% in 1943.

Thus returns to the extent of 25.9% of the total, showed members to be in the Armed Services. This, and expected future returns from overseas, permit the conclusion that possibly 27% of the Society's membership, or more than 5,000, are in the Armed Services. Many members entered the service this past year, as is shown by the change from 17.2% last year to the possible 27% this year.

Reorganization of Public Health Service

ON NOVEMBER 11, the President signed a bill for the reorganization of the U.S. Public Health Service. The bill as signed was S. 400, of the 78th Congress. Such legislation has been under consideration for some years.

A similar bill, H. R. 7616, was introduced into the 77th Congress by Congressman Bulwinkle in September 1942 and was reintroduced by him in January 1943, as H. R. 649. Both these bills discriminated against engineers in the Public Health Service, since neither permitted them to hold administrative positions, but restricted such appointments to commissioned medical officers.

The original draft of S. 400, as introduced by Senator Thomas, also prevented engineers from holding administrative positions. The American Society of Civil Engineers protested this discrimination and through its representative at Washington brought the matter to the attention of Congressman Bulwinkle, Senator Thomas, and others. When hearings were held on the bill by the House Committee on Interstate and Foreign Commerce, a statement outlining the Society's position was placed in the record.

The Society also brought to the attention of the House Committee, and interested Congressmen, the fact that officers in the Public Health Service assigned to hazardous war duties did not have protection comparable to that provided for the officers and men of the armed forces. It was recommended that this condition be considered and remedied in the pending legislation. The law, as passed, incorporated both recommendations made by the Society.

The new law provides that the Public Health Service shall consist of the Office of the Surgeon General, the National Institution of Health, and two bureaus, to be known as the Bureau of Medical Services and the Bureau of State Services. The law also authorizes the establishment in the Office of the Surgeon General of a division of Sanitary Engineering, the chief of which shall be a commissioned sanitary engineer of the regular Corps, who shall have the grade, pay, and allowance of an Assistant Surgeon General.

It is believed that the present legislation will permit a much needed reorganization of the entire Public Health Service, and that engineers have now received the recognition to which their service and training entitles them in this branch of the federal government.

United Engineering Trustees Elects Officers

OFFICERS elected for United Engineering Trustees, Inc., for the coming year have recently been announced. F. Malcolm Farmer, vice-president and chief engineer of the Electrical Testing Laboratories, New York, and an authority on electrical measurements, electrical insulating materials, and high-voltage cables, has been elected president of this organization, which is the joint agency of the four Founder Societies. At present, Mr. Farmer is consultant to the Ordnance Department.

Other officers elected include Arthur S. Tuttle, Past-President and Hon. M. Am. Soc. C.E., consulting engineer, as vice-president and treasurer; Charles E. Stephens, vice-president of Westinghouse Electric and Manufacturing Company, as vice-president and chairman of the Finance Committee; and W. D. B. Motter, Jr., assistant to the vice-president of the Chile Exploration Company, as assistant treasurer. John H. R. Arms, general manager of the corporation, continues as secretary.

United Engineering Trustees was founded by charter in 1904 "to advance the engineering arts and sciences in all their branches, to further research in science and engineering, to maintain a free public engineering library, and to advance in any other manner the profession of engineering and the good of mankind." It administers the Engineering Societies Building, the Engineering Societies Library, and endowment funds of the Engineering Foundation.

President Whitman Voices Disapproval of the Kilgore Bill

The Kilgore Bill, which would delegate extremely broad powers over technical personnel and facilities to an appointed administrator, has been unanimously disapproved by the Society's Board of Direction. When the bill was first introduced into the 77th Congress, as S. 2721, action of the Board was communicated to Senator Kilgore by Secretary Seabury. The bill was revised and reintroduced to the 78th Congress as S. 702 and H.R. 2100. The Board of Direction again considered the bill and directed President Whitman to state the disapproval of the Board to Senator Kilgore's committee. President Whitman's letter follows. For your information a synopsis of the Kilgore Bill is also given.

October 29, 1943

Hon. Harley M. Kilgore
Chairman, Kilgore Sub-Committee of the
Senate Military Affairs Committee
United States Senate
Washington, D.C.

Sir:

At your request the Board of Direction of the American Society of Civil Engineers (membership October 26, 1943;— 19,141) studied your bill "To mobilize the scientific and technical resources of the Nation, to establish an Office of Scientific and Technical Mobilization, and for Other Purposes," first, as introduced into the 77th Congress and again, as introduced into the 78th Congress, as S. 702, companion to which is H.R. 2100.

In connection with Bill S. 2721 of the 77th Congress, you provided each member of the Society's Board of Direction with copies of the Bill and copies of certain of the Hearings. The action of the Board, taken at its regular meeting in January 1943 was in unanimous disapproval of the Bill, which action was communicated to you by Mr. Seabury, Secretary of the Society, under date of February 19, 1943, and in which it was asked that the Board's expression of disapproval of the Bill be inserted in any reports (or hearings) that had reference to that Bill.

The Board of Direction, at its regular meeting held in April 1943, again gave consideration to the Bill, revised as S. 702 as introduced into the 78th Congress, and again expressed unanimously its disapproval of the Bill and directed that the President and Secretary of the Society be prepared to submit a protest in writing or to appear in protest at any hearings that may be held.

I am familiar with the resolution adopted by the American Association for the Advancement of Science, both as to its method of determining upon that resolution and as to its recommendation "that the Kilgore Bill (S. 702) be not passed either in its present form or in any other form containing similar provision." See *AAAS Bulletin* August 1943.

Also, I am familiar with and have studied carefully the analysis of the 12 sections of the Bill as set forth on pages 135, 136, 137 of the August 6, 1943 issue of *Science*. With the analysis and with all of its remarks in disfavor of the Bill, I agree, and believe that in doing so I am expressing the opinions that would be subscribed to by the members of the Board of Direction of the American Society of Civil Engineers, if their individual opinions were to be sought.

Also, I am confident, from the many letters received from members of the Society expressing disapproval of the purpose and terms of the Bill S. 702, that a poll of the membership would demonstrate almost unqualified disapproval of the Bill.

For my own part, I see in the Bill the regimentation of scientists and technicians; — in fact all intellectual attainment, to a confiscatory degree. The "Administrator" is given the power to make rules and regulations as he may desire which it is stated will "have the force and effect of law." The Administrator is given the power to adjudge one guilty of a crime punishable by fine or imprisonment. Not one of these provisions, nor of several others, do I see to be consonant with what is generally understood by the expression "the American way of life."

I respectfully urge, as President of the American Society of Civil Engineers, that Bill S. 702, or its companion, H.R. 2100, be not passed either in the present form or in any other form containing similar provisions and further request that this letter be made a part of any records or publications of hearings that pertain to these Bills.

Very truly yours
Ezra B. Whitman, *President*

Synopsis of the Kilgore Bill

A brief synopsis of the Kilgore Bill has been extracted from an analysis of the bill published in "Science," August 6, 1943, by the American Association for the Advancement of Science. This bill is entitled: "A bill to mobilize the scientific and technical resources of the Nation, to establish an Office of Scientific and Technical Mobilization, and for other purposes."

Section 1 recites, first, the reasons for the bill, effective both in time of war and in time of peace. In enumerating the "serious impediments" to the "full development and application of the nation's scientific and technical resources," the bill uses such terms as "unassembled and uncoordinated state of information," "unplanned and improvident training, development, and use, of scientific and technical personnel . . .," "delay and ineffectiveness in meeting urgent scientific and technical problems . . . ." Section 1 contains also a declaration of policy, using such terms as "appraise," "mobilize," "assemble," "coordinate," "promote," "aid," "encourage," "discover and develop substitutes," "promote interest in scientific and technical education," "provide guidance," "standardize," and "establish a national scientific and technical office."

Section 2 defines terms used in the act. "Scientific and technical facilities shall include all real and personal property, . . . programs, projects, . . . methods, processes, procedures, . . . patents, inventions, . . . information or knowledge of every description used or intended to be used for scientific or technical purposes in research and development or in the production or supply of war or civilian goods or services." "Scientific and technical personnel shall include all persons, excepting physicians and dentists, who have completed any course of study in any college or university in any branch of science or its practical application or who have had not less than an aggregate of six months' training or employment in any scientific or technical vocation." "Agency or establishment" means any Federal or State agency or other body or any "local government, person, firm, or partnership engaged in business for profit, or any corporation, profit or non-profit, association, school, college, and university." In short, "scientific and technical facilities," as used in S. 702, includes every means useful in any way for the production of "war or civilian goods or services," "scientific and technical personnel" includes every person, except physicians and dentists, who has completed a college course in any branch of science or who has been employed for six months on any kind of work that may be called technical; and "agency or establishment" includes every agency, corporation, person, partnership, association, school, college and university, whether or not organized for profit and whatever its purposes or activities may be. It would be difficult to make more inclusive definitions.

Section 3 defines the organization of the "Office of Scientific and Technical Mobilization." It is to be under the direction of an "Administrator" appointed by the President to serve at the pleasure of the President, and of a salaried "National Scientific and Technical Board," also appointed by the President, but whose duties are to be defined by the Administrator. This Board is to consist of six members, besides the Administrator, one to represent industry, one to represent agriculture, one to represent labor, one to represent the consuming public and "two additional members at large who shall be scientists or technologists." By previous definition in the bill, to be classed as a scientist or a technologist it is sufficient to "have had not less than an aggregate of six months' training or employment in any scientific or technical vocation." The administrator will appoint all other employees, and he may waive the provisions of the civil service laws and regulations if he determines it to be necessary to do so.

Provision is made also for a non-salaried "National Scientific and Technical Committee," consisting of the Board previously mentioned, a representative from each of such Federal departments as the President shall designate, four additional representatives of the consuming public, six additional members representing labor, six representing management (including small business) and three additional scientists or technologists. That is, the Technical Committee will consist of twenty-five to thirty members, of whom five must be scientists or technologists in the sense that each of them shall "have had not less than an aggregate of six months' training or employment in any scientific or technical vocation." This committee is to be appointed by the President to advise and consult with the Administrator at least once a month upon basic policies of the Board.

Section 4 defines the powers of the proposed Office, effective in times of peace and of war. Blanket authority is given for many purposes, including the powers to formulate, finance, control, contract for and operate all undertakings or projects that the Administrator shall determine fall under the broadly inclusive definitions of "scientific and technical facilities," "scientific and technical personnel" and "agency or establishment" previously given. This section explicitly provides that these sweeping powers are to be exercised in accordance with rules and regulations prescribed by the Administrator and that they "shall have the force and effect of law" of Congress.

Section 5 transfers to the Administrator, by amending the Selective Training and Service Act of 1940, control over the deferment from military service of persons who, under the definitions of the act, are classed as "scientific and technical personnel."

Section 6 gives the Administrator, in time of war, the right to requisition, subject only to review by the President, the stupendous means of production that, under the act, are classified as "scientific and technical facilities," and to represent before the War Production Board "any application for allocation of, and priority for, any critical material and equipment in scientific and technical research and development."

Section 7, "any provision of law to the contrary notwithstanding," vests the Office with the "exclusive right to use, and with the exclusive right to license others to use, (1) any invention, discovery, patent, or patent right which has heretofore resulted, or shall hereafter result, from research or invention for the carrying on of which the United States or any department, agency or establishment thereof either has heretofore contributed at any time since the declaration of national emergency on May 27, 1941, or shall hereafter contribute any money, credit, physical facilities or personnel; and (2) any invention, discovery, patent, or patent right which is at the time of the enactment of this act, or shall hereafter become, to any extent the property of the United States or of any department, agency or establishment thereof." These broad powers are vested in the Office however small the contribution by the Government or governmental agency may have been. The administrator is "authorized and directed to prescribe and promulgate rules and regulations which shall thereupon have the force and effect of law for the enforcement of the provisions of this section, . . ."

Section 8 gives the Administrator the power to require all information he may desire "concerning scientific and technical facilities during the existence of a state of war and concerning scientific and technical personnel at all times." "Any person or establishment [possibly a university] refusing or wilfully failing to furnish the [information] . . . shall, upon conviction thereof, be fined not more than $5,000 or imprisoned for not more than one year, or both."

Section 9 authorizes the appropriation of $200,000,000 to carry out the provisions and purposes of the act. This section also authorized the Administrator to organize corporations and to make loans, to, or purchase all or part of the capital stock of, corporations whenever he deems it necessary to do so for the more effective exercise and performance of his own powers and duties or of those of the Office.

Section 10 gives the Administrator important powers usually lodged in courts, and it provides that "any person who wilfully violates any order, rule, or regulation promulgated by the Administrator under the authority of this act shall, upon conviction thereof, be fined not more than $5,000 or imprisoned for not more than one year, or both."

Section 11 requires the Administrator to render annually to the President and to Congress a written report, summarizing the activities of the Office and the status and progress of science affecting the public interest.

Section 12 provides that if any clause, sentence, or paragraph of the act is invalidated by any court action it shall not affect the validity of the remainder of the act.

Standardized Dimensions of Building Materials Proposed

A BASIS for the coordination of the dimensions of building materials and equipment has been proposed by the American Standards Association for adoption by the construction industry. The recommendation establishes a standard module of 4 in. as the base for all measurements on building plans. As a result of the acceptance of this proposal each line of equipment and material manufacturing would adapt its products to the modular dimensions and make available standard products.

As an example, structural clay products will be sized so that masonry, when laid up, will measure some multiple of 4 in. Therefore in designing a masonry structure, a 4-in. grid can be used for laying out all intersections and openings. Window sash manufacturers can then standardize their products so that they will be readily fitted into openings measuring some multiple of 4 in.

The advantages of the dimensional coordination apply to the preparation of the building plans and assembly details, the manufacture of materials and equipment, and the site fabrication of the same into the complete building. The coordination of the dimensions of building materials and equipment does not contemplate the standardization of building design. As a matter of fact, the coordinated dimensions of component parts will provide complete flexibility in planning the building layout, and a variety of dimensioned parts and equipment, available in "stock sizes," adequate to meet the requirements of utility and appearance. Furthermore, the preparation of detail drawings will be expedited.

Dimensional coordination of individual parts will eliminate unnecessary intermediate dimensions in determining the number of "stock sizes" for individual materials and items of equipment while it will encourage the use of a limited, but adequate, number of stock sizes. Thus the cost of special details, custom manufacturing, and the maintenance of slow-moving stocks will be eliminated. The application of dimensional coordination to such materials as pre-formed clay and concrete products, and doors and windows will avoid the cutting and fitting usually required in wall construction where these materials are used.

Dimensional coordination of materials does not preclude the use of conventional methods of cutting and fitting if, for any reason, the requirements of design call for materials to which the principles of dimensional coordination have not been applied. It will be obvious that the more completely the principles of dimensional coordination are applied to the component parts of structures as a whole, the greater will be the advantages resulting from simplification in detailing and manufacture, speed in erection, and reduction in the cost of construction. To insure the maximum degree of these advantages, the scope of ASA Project A62 includes the coordination of building plans and details with the coordination of building materials.

Modular design, as recommended by the American Standards Association, has been sponsored by the American Institute of Architects and the Producers' Council, Inc. The proposal was prepared by Committee A62 of the American Standards. On this committee the American Society of Civil Engineers is represented by R. L. Bertin, M. Am. Soc. C.E. Copies of the proposal may be obtained from M. W. Adams, secretary ASA Committee A62, 110 Arlington Street, Boston 16, Mass.

Study of Ground Water Instituted

IT HAS BEEN proposed by the Engineering Economics Division that the Division might well make a study, and issue a report, on "The Economic Importance of Ground Water." Before doing so, the Division wished to get the opinion of the Board of Direction and accordingly it asked that the question be presented at the Board's Atlanta meeting.

The Board approved this idea, authorizing the Division to proceed in establishing the necessary machinery. It went further and recommended that the Division ask the executive committees of the Waterways, the Irrigation, and the Hydraulics Division each to name a representative member to collaborate in this activity. Engineers familiar with the general subject are aware of its basic importance. They will accordingly await the results of the studies conducted by this new committee with great interest.

Index for 1943 CIVIL ENGINEERING in This Issue

As the reader will no doubt notice, the index for all articles and items published in Civil Engineering during the year 1943 has been bound in with this, the December issue. It is particularly handy when bound in with the twelve issues which it covers, but in any case it provides a means of ready reference to the material that has appeared in this publication during the year just ending.

The advantage of having the index come out with the December number, at the end of each volume, is especially evident if the twelve issues are to be bound before the end of the year. As the index is printed in a separate form, at the very back of this number, it is possible to remove it intact merely by unloosening the wire staples. For those who may require them, separate copies of the index are available from Headquarters at 15 cents each. These will have a first page designed to constitute a fitting title page for the volume.

From an editorial standpoint, the difficulties of getting the index ready to appear in this issue, so as to include the number in which it appears, are obvious. However, the appreciation of many members, engineering offices, and libraries, who desire to make immediate use of it, shows that the additional labor is warranted.

Secretaries Honored

Secretary Seabury and Secretary L. Austin Wright of the Engineering Institute of Canada, because of the very friendly relations that have always existed between the two organizations, have frequently found collaboration necessary. On one of Mr. Wright's recent trips to New York, he and Mr. Seabury discovered in the course of their conversation that neither was a member of the other's society although both were apparently eminently qualified for such membership. Thereupon, in a spirit of friendly rivalry, they decided to submit the two applications and see which would first become a member of the other's society.

It so happened that both applications went through the qualifying procedure in practically the same period of time, so that both memberships were ready to be awarded at the same time. Aware of this interesting situation, the two secretaries exchanged membership certificates and badges. As a result Secretary Seabury has an additional badge to wear and is proudly displaying the new certificate of membership on his office wall. So probably also is Dr. Wright.

Lectures on Postwar Construction

A course of lectures on postwar construction and city and regional planning is being sponsored by the Philadelphia Section of the Society. Three broad divisions will be covered in the series of 31 weekly sessions which are being given at the University of Pennsylvania School of Fine Arts. The approach to city planning and human requirements in planning, and the physical pattern and structure of the city will be discussed by eminent authorities, including Charles W. Eliot, Lorin A. Thompson, Robert D. Calkins, Nickolaus L. Engelhardt, Weaver Pangburn, Gilmore D. Clarke, Robert B. Mitchell, Walter Thomas, John H. Neeson, and Thomas Buckley.

The course began on November 2 and will extend to May 23. The subscription for the series is $50.

Officers of Engineering Foundation

At the annual meeting of the Engineering Foundation, which was held in New York in October, A. L. Queneau, metallurgist of the U.S. Steel Corporation, was reelected chairman for the ensuing year. Kenneth H. Condit, dean of engineering at Princeton University, was elected vice-chairman; Edwin H. Colpitts, formerly director of the Bell Telephone Laboratories, was reelected director; and John H. R. Arms, was reelected secretary.

Thirteen researches, many of importance to war work, were conducted during the year just closed. These include investigations in the field of soil mechanics and foundations, alloys of iron, rolling steel, furnace performance factors, insulating oils and cable saturants, welding, and educational projects.

Revised Schedule—1943 TRANSACTIONS

Delays in the issuing of the 1943 Transactions, particularly the bound volumes, have already received notice in previous issues. Starting with the paper-bound volumes, there was a slight holdup; however, many of these volumes were mailed on time, and all went out within a few days of the regular mailing date.

With regard to the special bindings, the difficulties are greater because of the multiplication of processes. Both material and labor offer difficulties, particularly the latter, but every effort is being made to expedite the work.

Latest advices indicate that shipping of the cloth-bound volumes should begin early in December and be completed during that month. Then come the half-morocco bindings in January, and it is expected that this work will be completed in the first half of the month. In view of the understandable nature of the difficulties, the forebearance of members will be appreciated.

Postwar Planning—Program and Classifications

The Society's Committee on Postwar Construction believes that it would be well to know from time to time the progress that is being made throughout the country in the planning for postwar construction projects. Planning proceeds in stages, and it is essential that these stages be defined so that there will be no question whether a project is in the idea stage or whether it is in the actually completed-plan stage. With this thought in mind, the Committee has adopted and puts forth the following designations, as "standards," for the various stages of planning, accompanied by a classification of standard types of projects. If engineers, architects, and contractors are able to analyze planning progress by some such scale as that here proposed, it will simplify and clarify much of the confusion now existing as to the amount of planning work actually being done.

Standard Designation for the Various Stages of Planning of Postwar Construction Projects

Stage I. Idea Stage

Projects in this category are those known by name and description only, which are being visualized by various proponents or are pictured in the form of sketches, but on which no basic engineering studies have been made.

Stage II. Report Stage

These are projects which have crystallized to a point where an engineering report is being or has been prepared covering scope and need of the project, general layout, preliminary estimate of cost, and similar data.

Stage III. Design Stage

This covers specific projects for which complete surveys, borings, soundings, etc., are being made, land acquisition maps are being prepared, and on which plans, specifications, and contract documents are in process of preparation, such as are required as a basis for securing bids.

Stage IV. Completed-Plans Stage

This covers projects on which plans, specifications, and contract documents have been completed and laid aside to be used at the opportune time for securing firm bids.

Stage V. Bidding Stage

This includes all projects on which plans, specifications, and contract documents for bidding have been completed, all necessary rights-of-way have been secured, and the necessary funds have been authorized and allocated by proper authorities.

Standard Classification of Types of Projects

For purposes of tabulating and subdividing the various classifications of work, when so desired, it is recommended that the following subdivisions be used:

1. Highways
2. Bridges
3. Railroads and Terminals, Rapid Transit Systems, Subways
4. Airports, Terminals, and Landing Strips
5. Pipe Lines, Oil and Gas

6. Power Generating and Transmission Systems
7. Municipal Improvements (Streets, Sewers, Water Supplies, Parks, etc.)
8. Public Buildings, Schools, and Hospitals
9. Commercial and Industrial Buildings
10. Housing
11. Waterway Improvements (Dams; Docks; Locks; Port, Harbor, and Channel Improvements)
12. Flood Control, Irrigation, Drainage, and Reclamation
13. Military Projects
14. Foreign Projects

The philosophy of the Committee's work has already been covered in the article that appeared in the September issue, page 439, and was reprinted in pamphlet form, as noted in the November issue, page 556.

Special Issue of "West Virginia Engineer"

FOR its November number, *The West Virginia Engineer* has devoted a large share of its editorial space to activities of the American Society of Civil Engineers. This issue of the monthly, which is published by the West Virginia Society of Professional Engineers, carries articles by George W. McAlpin, J. N. Wallace, Junius T. Moore, R. P. Davis, W. O. McCluskey, Jr., and Charles F. Goodrich, all members of the Society, as well as articles by President Whitman and Secretary Seabury. Another feature of the November issue is a reprint of an article by L. L. Jemison, M. Am. Soc. C.E., which appeared in the August CIVIL ENGINEERING.

New Society Prize Instituted—The J. C. Stevens Award

ANNOUNCEMENT was made in the previous issue that the Board of Direction at its Atlanta meeting had confirmed the establishment of a new prize, endowed by J. C. Stevens, M. Am. Soc. C.E., and bearing his name. The purpose of this prize, and the conditions surrounding its award each year, are best described by giving the detailed provisions for it, also approved by the Board. These are as follows:

"1. The prize shall be designated as 'The J. C. Stevens Award.'

"2. It shall be given each year to the one adjudged to have submitted the best discussion of a paper published in 'Transactions' in the field of hydraulics (including fluid mechanics and hydrology).

"3. Only one holding some grade of membership in the American Society of Civil Engineers shall be eligible for the award, and no one shall receive the prize or any portion thereof more than once.

"4. Normally the prize shall consist of books costing not more than $50; however, the Executive Committee may authorize the Secretary to exceed that limit if the income from the capital fund is sufficient to justify it.

"5. The recipient may select any books he desires, indicating his choices to the Secretary of the Society for purchase. In the event that the discussion is submitted by more than one person the prize shall be divided as equally as possible among them.

"6. In the front of each book shall be fixed a book-plate setting forth the facts regarding the award, signed by the President and Secretary of the Society. In addition the outside back binding of each book shall be stamped, if practicable, as follows:

The
J. C. Stevens
Award
American Society of
Civil Engineers
[year]

"7. The selection of the recipient of the award shall be the responsibility of the Executive Committee of the Hydraulics Division of the Society."

It is of special interest that the J. C. Stevens Award covers a new and a large field—that of discussions of technical papers. Ordinarily the volume of discussion is about equivalent to the volume of the original papers. The number of those contributing, however, is of course much greater. Not all discussions are eligible under this new award—only those dealing with hydraulics. That this is a broad field, even so, is clear from the fact that not only the Hydraulics Division but also the Irrigation, Power, and other Divisions of the Society contribute to the subject.

Because of the specialized nature of this prize, the Society will look to the Executive Committee of the Hydraulics Division for recommendations. The first award is expected to be announced a year from now. It will apply to discussions on hydraulics appearing in the 1943 TRANSACTIONS, just issued.

News of Local Sections

Scheduled Meetings

ALABAMA SECTION—Annual Meeting at the Whitley Hotel, Montgomery, on December 10 and 11, at 11 a.m.

CENTRAL OHIO SECTION—Dinner meeting on the Ohio State University campus on December 16, at 6:30 p.m.

CINCINNATI SECTION—Meeting at the Herman Schneider Foundation on December 7, at 8 p.m. (Subject "Ohio River Navigation".)

CLEVELAND SECTION—Dinner meeting at the Cleveland Engineering Society on December 10, at 6:30 p.m.

COLORADO SECTION—Dinner meeting at the Edelweiss Restaurant on December 13, at 6:30 p.m.

CONNECTICUT SECTION—Lecture at Strathcona Hall, New Haven, on December 9, at 8 p.m. (Joint meeting with Connecticut Society of Civil Engineers and other engineering groups.)

ILLINOIS SECTION—Luncheon meeting at the Chicago Engineers' Club on December 17, at 12:15 p.m.

KENTUCKY SECTION—Dinner meeting at the Canary Cottage on December 10, at 6:30 p.m.

LOS ANGELES SECTION—Dinner meeting at the University Club on December 8, at 6:30 p.m.

MARYLAND SECTION—Annual dinner meeting at the Engineers' Club of Baltimore on December 7, at 5:45 p.m.

METROPOLITAN SECTION—Technical meeting in the Engineering Societies Bldg., on December 15, at 8 p.m.

MIAMI SECTION—Dinner meeting at the Royal Center on December 2, at 7 p.m.

NEBRASKA SECTION—Dinner meeting on December 14, at 6:45 p.m.

NEW MEXICO SECTION—Dinner meeting at the Alvarado Hotel on December 16, at 7:30 p.m.

NORTHWESTERN SECTION—Dinner meeting at the Campus Club, University of Minnesota, on December 6, at 6:30 p.m.

PHILADELPHIA SECTION—Dinner and meeting at the Engineers' Club on December 14—dinner at 6 p.m.; meeting at 7:30 p.m.

SACRAMENTO SECTION—Regular luncheon meetings at the Elks Club every Tuesday at 12 m.

ST. LOUIS SECTION—Dinner meeting at the Coronado Hotel on December 4, at 6:30 p.m.

SAN FRANCISCO SECTION—Annual meeting at the Engineers' Club on December 21, at 5:30 p.m.

TENNESSEE VALLEY SECTION—Dinner meeting of the Chattanooga Sub-Section at the Ross Hotel on December 14, at 6 p.m.; dinner meeting of the Knoxville Sub-Section at the S & W Cafeteria on December 14, at 5:45 p.m.; meeting of the Asheville Sub-Section at the George Vanderbilt Hotel on December 20, at 7 p.m.

TEXAS SECTION—Luncheon meeting of the Dallas Branch at the Y.M.C.A. on December 6, at 12:15 p.m.; luncheon meeting of the Fort Worth Branch at the Blackstone Hotel on December 13, at 12:15 p.m.

TRI-CITY SECTION—Dinner meeting at the Mississippi Hotel on December 10, at 6:30 p.m.

Recent Activities

Buffalo Section

The October meeting of the Section was devoted to a symposium on postwar planning. First, Col. William Kelly, Honorary Member of the Society and president of the Buffalo, Niagara and Eastern Power Company, outlined the problems of postwar planning in relationship to the "Niagara Frontier," where major war industries must convert to civilian production as soon as peace is declared. The other scheduled speaker was Bertram D. Tallamy, local consultant, who discussed "Common Sense in Postwar Planning." At the conclusion of the technical program John W. Cowper, Director of the Society, spoke briefly on Local Section matters. The guest of honor and speaker at the November meeting was Col. Henry T. Woodbury, district engineer at Chicago, whose subject was the Alaska Highway. Sound moving pictures of the construction of the project were shown through the courtesy of the Corps of Engineers.

Central Illinois Section

On October 17 members of the Section entertained Thomas E. Stanton, Vice-President of the Society and head of the Materials and Research Department of the California State Division of Highways. Mr. Stanton discussed the solution by his research department of numerous highway problems that have arisen in the state. A program on rubber had been arranged for a meeting held in Springfield later in the month. The speakers on the latter occasion were R. B. Redick, branch manager of the tire division of the U.S. Rubber Company; Bruce D. Caulkins, of the Detroit office of the U.S. Rubber Company; and John B. Carnell, district mileage officer of the OPA.

Central Ohio Section

The Central Ohio Section held a luncheon meeting in Columbus on October 21, with Herbert H. Howell as speaker. Mr. Howell, who is airport engineer for the Civil Aeronautics Administration, discussed the work being done by the CAA in planning for postwar commercial aviation.

Cleveland Section

At the October meeting of the Section, which was held at the Case Observatory, members of the Section were given an opportunity to learn about telescopes. The speaker of the evening was Dr. Jason J. Nassau, professor of astronomy at the Case School and director of the observatory. Dr. Nassau described how Galileo, with a few pieces of glass, constructed the world's first refracting telescope. The largest instrument of this type to date is the 100-in. telescope on Mt. Wilson. At the conclusion of the program, members were given the opportunity to view the moon through the Schmidt telescope, one of the most efficient types yet devised, which is housed in the Case Observatory.

Colorado Section

Postwar plans of the city of Denver were explained by Carl Feiss, planning engineer for the city and county of Denver, at the October meeting of the Colorado Section. In order to obviate the danger of unemployment to many in the Denver area in the postwar period, each city department has been asked to submit plans for three types of projects. The concluding feature of the program was a colored motion picture of a trip to the Skagit Project, which was shown by J. E. Warnock, of the U.S. Bureau of Reclamation. The principal speaker at the November meeting was Lt. Comdr. J. B. Symes, of the U.S. Naval Reserve, who gave interesting data on the expansion of the Navy since Pearl Harbor.

Ithaca Section

At the annual meeting of the Ithaca Section, held on the campus of Cornell University on October 25, the following officers were elected for the coming year: W. L. Malcolm, president; L. L. Huttleston, first vice-president; George D. Westra, second vice-president; and John E. Perry, secretary-treasurer. The technical program consisted of a talk on the engineering aspects of archaeology, which was given by Prof. A. H. Detweiler, of the college of architecture, Cornell University. Professor Detweiler spoke from the vantage point of seven years' experience in the Near East serving on archaeological expeditions for several universities.

Kansas City Section

Members of the Burns and McDonnell Engineering Company were in charge of the technical program at the October 28 meeting of the Kansas City Section. R. E. McDonnell, head of the firm, gave a brief review of the history of the organization, and C. A. Smith, another member of the firm, followed with an entertaining series of questions on the Dr. I. Q. pattern, all dealing with the history of the Section and the Society. Other members of the organization then gave a series of short talks dealing with problems encountered in their engineering practice. In nearly all cases the talks were illustrated by large-scale drawings mounted in full view of the audience. The speakers were R. G. Kincaid, Glenn Hands, C. S. Timanus, Earl J. Thomson, A. F. Hartung, Glenn C. Boyer, K. H. Larkin, and R. L. Baldwin.

Kentucky Section

Student Chapter members at the University of Louisville and the University of Kentucky were guests of the Section for the October dinner meeting. The entire program had been arranged by the Committee on Junior Activities, under the chairmanship of J. V. Wells, and all the speakers were Juniors. "What's Wrong with Us"—presented by Earl H. Schaaf, of the U.S. Engineer Office at Louisville—was the subject of the first talk. Mr. Schaaf had charts and figures showing how attendance at the Section meetings has remained practically static since the Section was founded in 1935, while membership in the Section has materially increased. Other speakers were L. F. Birkel, of the Sanitary Engineering Division of the Kentucky State Board of Health, and William F. Guyton, of the U.S. Geological Survey.

Maryland Section

At the October meeting the principal speaker was Capt. LeRoy Reinberg, commandant of the U.S. Coast Guard yard at Curtis Bay, Maryland. Captain Reinberg came to the yard as a cadet a few years after it was established in 1900, and in the intervening period has had opportunity to observe its development from a small station to its present position as a major Coast Guard base. A talk on stainless steel in the war and postwar period comprised the technical program at the November meeting. This was given by A. L. Feild, technical director of the Rustless Iron and Steel Corporation, of Baltimore.

Metropolitan Section

Activities and objectives of the Society's Committee on Postwar Construction were discussed by G. Donald Kennedy, chairman of that committee, at the October 20 meeting of the Metropolitan Section. Mr. Kennedy impressed upon the 400 members in attendance the need for implementing the Society's program by action on the part of Local Sections. Action now is necessary, he said, if favorable economic conditions are to be realized at the end of the war.

At the October 27 meeting of the Junior Branch of the Section, Archie N. Carter, assistant editor of *Engineering News-Record*, spoke on the Pan-American Highway. Mr. Carter, who recently traveled the length of the highway through Central America, told of the fine cooperation between the Central American republics and United States agencies in the construction of this road. Experiences in the relocation of heavy structures were related by George F. Flay, of Spencer, White and Prentis, Inc., at the November 10 meeting.

Northwestern Section

Discussion of various aspects of postwar planning comprised the major part of the technical programs at both the October and November meetings of the Section. At the first of these sessions Chester S. Wilson, Minnesota Commissioner of Conservation, discussed the effect of the war on our natural resources, and E. L. Filby, principal assistant engineer for Black and Veatch, of Kansas City, spoke on postwar planning for water and sewer works. At the November meeting George H. Herrold, member of the Section's Postwar Planning Committee, spoke on the work being done by the committee.

Philadelphia Section

A program on shipbuilding in the Philadelphia area had been arranged for the October meeting of the Section, which was held under the chairmanship of Comdr. Wilmer Z. Kline, assistant public works officer for the Fourth Naval District. The first speaker was Arthur R. Anderson, head of the technical group in the engineering department at the Cramp Shipbuilding Company, whose subject was the "Application of Civil Engineering Principles to Shipbuilding." He was followed by Ernest H. Rigg, chief naval architect in charge of design for the New York Shipbuilding Corporation, who discussed the launching of ships. The showing of several films on ship launching concluded the program.

PITTSBURGH SECTION

On October 26 the Pittsburgh Section and the Engineers' Society of Western Pennsylvania held a joint meeting on postwar planning. Dean Edwards, chief engineer of the Borough of Manhattan, and A. J. Ackermann, director of engineering for the Dravo Corporation, were the principal speakers. In addition, Park H. Martin, chief engineer of the Allegheny County Planning Commission, and Samuel Fuller, president of the Constructors' Association of Western Pennsylvania, discussed the progress being made in the Pittsburgh area. Prior to the meeting, the Constructors' Association of Western Pennsylvania gave a dinner in honor of Mr. Edwards.

ROCHESTER SECTION

A talk on the organization and activities of the New York State Department of Public Works comprised the technical program at the October 20 dinner meeting of the Section. This was given by Elmer C. Lawton, district engineer for the New York State Department of Public Works.

SACRAMENTO SECTION

In a historical summary of soil conservation districts on October 5, Prof. Walter W. Weir held legislative short-sightedness responsible for the indifferent success of such districts in California. On October 26, Harold Conkling, deputy state engineer, delivered a paper on "Raymond Basin Ground Water Adjudication." The procedure constitutes an engineering landmark, as it is the first adjudication of a large underground water source by an administrative-engineer referee. The twentieth observance of Ladies' Day on October 19 featured Colonel Hall, post surgeon of Mather Field, who said all he dared about "Army Housekeeping."

ST. LOUIS SECTION

At the annual meeting of the Section, which took place on October 25, the following officers were elected for the coming year: Robert W. Hodson, president; Robert B. Brooks, vice-president; and E. E. Rippstein, secretary-treasurer. H. E. Fresh will continue as vice-president for another year. The principal speaker was Col. R. C. Williams, whose subject was "The Role of the Military Engineer in the War Today." The special training for difficult roles that the engineer is receiving will be of value to the entire construction industry in the future, Colonel Williams stated. Others who spoke were Colonel Lewis, the new commandant of Jefferson Barracks, and Capt. Robert I. Hodson, Jr., who discussed his experiences as a pilot over India and the Burma Road.

SAN FRANCISCO SECTION

The technical program for the October 19 meeting of the San Francisco Section was arranged by the Section's Sanitary Committee. William J. O'Connell, Jr., San Francisco consultant, spoke on the subject, "Wastes from California Industries—Pollution Loadings and Treatments." His talk covered the treatment of industrial and cannery wastes in California and other industrial centers in the United States and was illustrated with lantern slides. By a coincidence, Mr. O'Connell was also the speaker before the September meeting of the Junior Forum, his subject of discussion before this group being trends in the unionization of engineers.

SEATTLE SECTION

Washington's postwar highway program was the subject of a symposium presented at the September meeting of the Section. Those participating were R. B. Bantz, state director of highways; Ray Dinsmore, assistant director; and Ralph Finke, bridge engineer. Later in the evening Howard F. Peckworth, assistant to the Secretary of the Society, discussed the subject of unionization of engineers.

SYRACUSE SECTION

The Syracuse Section inaugurated its twentieth year of affiliation with the Society on October 25 with a dinner meeting. The guest of honor was M. P. Catherwood, who later addressed a joint meeting of the Section and the Technology Club of Syracuse on the subject, "New York State Postwar Industrial Planning." Mr. Catherwood, who is commissioner of the New York State Division of Commerce, stated that, "If we have learned anything from the finger-burning that followed the last war, we know that certain things can and must be done."

TACOMA SECTION

On October 29 members of the Tacoma Section heard George C. Heikes, manager of the Tacoma plant of the Olin Corporation, speak on his experiences in various parts of Europe from 1925 to 1934. Mr. Heikes, who acted as engineering representative for the Anaconda Copper Company during that period, commented especially on conditions in upper Silesia, western Poland, and eastern Germany, describing the social and economic lives of the people of this region.

TENNESSEE VALLEY AUTHORITY

The Chattanooga Sub-Section met jointly with local groups of the other Founder Societies on October 12. Speakers were K. E. Hapgood, who spoke on the work of the National Committee on Electrical Transmission and Distribution, and L. A. Schmidt, Jr., who gave an illustrated talk on the leakage-correction work under Hales Bar Dam. A moving picture, entitled "Electronics at Work," was also enjoyed.

On October 15 members of the Knoxville Sub-Section heard Fred C. Seabey discuss the subject of hydraulics. First, Mr. Seabey spoke on "Unusual Flow Conditions in Open Channels." Then Boris A. Bakmeteff, professor of civil engineering at Columbia University, presented the subject, "Fluid Mechanics and Hydraulic Engineering."

UTAH SECTION

The principal speaker at the October meeting of the Section was Cleve H. Milligan, hydraulic engineer for the U.S. Engineer Department at Salt Lake City. After Mr. Milligan had read a paper entitled "Irrigation Science—the Foundation of Permanent Agriculture in Arid Regions," there were informal talks on postwar planning. The topic proved so interesting that it was decided to devote the November meeting exclusively to that subject, so Ora Bundy—member of the Commisson for the State Department of Publicity and Industrial Development—was invited as the guest speaker. Addressing the group on November 5, Mr. Bundy pointed out that Utah has experienced drastic changes as a result of the war and outlined what should be done during the transition to a peacetime basis.

WEST VIRGINIA SECTION

Members of the West Virginia Section held a dinner meeting, preceded by an afternoon business and technical session, at Charleston on October 1. Features of the afternoon program were the showing of motion pictures on the making of steel by the Carnegie-Illinois Steel Corporation, and a talk on the launching of boats by Forrest W. Ingraham, sales manager of the Marietta Manufacturing Company at Point Pleasant, Va. The dinner session was presided over by Owen M. Jones, and addressed by Col. William N. Carey, Society Director and chief engineer for the Federal Works Agency. Colonel Carey spoke on postwar planning, emphasizing the necessity of profiting by the disastrous results of lack of planning after the first World War and of planning a worth-while public works program.

Appointments of Society Representatives

GEORGE R. RICH, M. Am. Soc. C.E., has been appointed the Society's representative on the Sectional Committee on the Standardization of Shaft Couplings, Integrally Forged Flange Type for Hydroelectric Units, B 49 of the American Standards Association.

CHARLES M. SPOFFORD, M. Am. Soc. C.E., served as the Society's delegate on the occasion of the unveiling of a plaque honoring the late MANSFIELD MERRIMAN, M. Am. Soc. C.E., at Lehigh University on October 18.

ITEMS OF INTEREST

About Engineers and Engineering

"Big Brother" Pipeline to Supplement "Big Inch"

"BIG INCH," the new pipeline from the Southwest which reached its eastern terminal at Phoenixville, Pa., late in July, will ave a "Big Brother" that will greatly ssist in solving the gas and oil shortage n the East. This new 20-in. line, paralleling the "Big Inch," will almost double the mount of oil delivered to the East Coast ia pipeline. The new line is being laid ithin a few feet of the first line in much ess time that was required for the "Big Inch," since much of the excavating, learing, and grading work will not have o be repeated. "Big Inch" was completed only a few days short of year rom the day the first weld was made t Longview, Tex., a record that will, n all probability, be broken with the ew pipeline.

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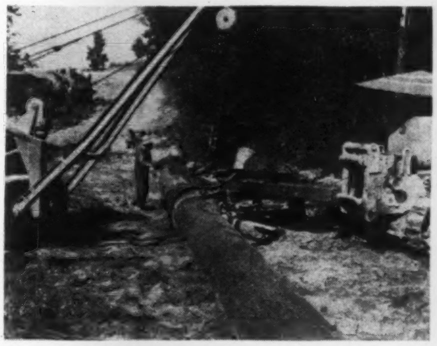
PIPE FOR THE "BIG BROTHER" LINE IS BLOCKED OVER ITS TRENCH FOR WELDING

© The Hobart Brothers Company, Troy, Ohio

WELDERS AT WORK ON THE "BIG BROTHER" PIPELINE

While capacity of the new line cannot e given, one can estimate the added mount of oil that will be sent to the east y reviewing the already published apacity of "Big Inch." The "Big Inch" as constructed of seamless steel pipe ith walls $^5/_8$ in. thick. Its capacity is 00,000 barrels of oil a day, equivalent to he daily capacity of about 25,000 railroad tank cars; and 29 booster stations, at 50-mile intervals, are used to force the oil through this 1,400 miles of pipeline. The rate of flow through "Big Inch" is $4^1/_2$ miles per hour, and it takes 14 days to make the complete trip from Longview, to New Jersey.



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PIPE BENDING MACHINE AT WORK ON "BIG BROTHER" PIPELINE

Much of the experience gained in building the "Big Inch" will be helpful in laying this 20-in. line. Heavier steel will be used under all large rivers as a safeguard against washouts during high waters in winter.

ASTP Soldiers to Wear Identifying Insignia

BEGINNING in November, more than 100,000 soldiers participating in the Army Specialized Training Program at 209 colleges and universities will wear identifying shoulder-patch insignia, the War Department has announced. The insignia will depict the sword of valor against a lamp of knowledge—the sword and lamp in dark blue on a yellow, octagon-shaped patch.

Artists of the Quartermaster Corps and Special Service Division of the Army Service Forces collaborated in designing a series of insignia that would be appropriate. To learn the preference of the soldiers in the program, a large number of trainees were invited to view several samples of proposed insignia. The pattern selected ran far ahead in popularity.

A short article oh the ASTP program and its work appeared in the October number under the authorship of Col. Herman Beukema, head of the work.

Texas and Mexico to Exchange Highway Engineers

TEXAS has just passed a law which serves as a practical demonstration of the Good Neighbor spirit between the Lone Star State and its southern neighbor, Mexico, according to the Office of Inter-American Affairs, Washington, D.C. The law authorizes the State Highway Commission to employ Mexican engineers or engineering students on state highway projects for periods of six months. A corresponding number of Texan engineers or engineering students is expected to work on Mexican highways for the same period.

The purposes of the measure are summed up in the following paragraph:

"The exchange of engineering employees with the Republic of Mexico for short periods of time will give the Texas Highway Commission an opportunity to assist the Federal Government in fostering and cementing closer and more harmonious relations with our neighbors to the South, and will likewise give the Texas Highway Commission and the Republic of Mexico the opportunity to study one another's engineering and construction methods."

Salvage Manual Available

A "Salvage Manual for Industry" has been published by the War Production Board. This volume contains 243 pages of well-illustrated information—most of it of a "how-to-do-it" nature—for the handling of waste materials. Prepared and edited by a board of practical salvage engineers and business paper editors, the book's major purpose is to speed the collection of scrap vital to war production. The suggestions and methods are, however, applicable to postwar operations. Copies at 50 cents each are available at the Government Printing Office, Washington, D.C.

After Victory Plans Prepared by State of Utah

THE Utah State Department of Publicity and Industrial Development has compiled in its recent publication, "After Victory Plans for Utah and the Wasatch Front," a wealth of statistical data relating to the state. Prepared under the direction of Ora Bunday, M. Am. Soc. C.E., the report is a cooperative attempt to assemble information for use in formulating plans for the future of Utah. Federal, state, and local agencies have contributed to the effort as have members of college faculties and individuals. The program includes sections on war and postwar industrial readjustment, agriculture, water and power, transportation, recreation and rehabilitation, public works, and community planning.

A realistic approach to a critical problem has been made in the preparation of this report. Utah—and especially the northwestern section of the state called the Wasatch Front—has undergone extensive wartime readjustments with the rapid expansion of industry. The readjustment necessitated by the return to peacetime operations will affect nearly all the 600,000 people in this area.

It is intended that means for implementing the recommendations of this cooperative planning program be sought and that other activities not considered in the present report be added as they are suggested. This study, which is among the first of its kind presented, provides a framework for formulation of more specific and detailed plans by private industries and governmental agencies.

N. G. Neare's Column

Conducted by

R. ROBINSON ROWE, M. AM. SOC. C.E.

"THE importance of time is a function of time!" Explaining his epigram, the Professor continued, "The number of shopping days before Xmas is more important just before Xmas and, for another example, there's the case of Septimus Heptason. When did he celebrate his seventh birthday?"

"He didn't even exist outside your misguided imagination," answered Joe Kerr. "Eliminating the extraneous data, you specified last October that "Saturday the 7th" recurred after a 7-month interval. But such intervals are 212, 213, 214, or 215 days, none of which is an integral number of weeks. *Ergo absurdum.* Even a day gained or lost at the Date Line wouldn't suffice."

"*Ergo* two calendars," guessed Ken Bridgewater. If Papa Heptason had baby Septimus baptized in a church using the Julian calendar, only to renounce it before the seventh tooth was cut, Joe's periods would be reduced by 13 days each. This doesn't answer, but 12 days in the 19th century will produce intervals of 203 days or 29 weeks, such as that between July 7, 1890 (O.S.) and Feb. 7, 1891 (N.S.). So his 7th birthday occurred July 19, 1897."

"That's illegal," countered Cal Klater, "but it could have been legal in 1752. Here's a copy of my great^5-grandfather's calendar showing how 11 days were dropped from September that year and proving that Septimus was born Saturday March 7, 1752 (O.S.) and cut his 7th tooth on Saturday October 7, 1752 (N.S.).

"Since custom celebrates the first birthday at age one and purists insist it occurs at age zero, his 7th birthday may be put in either 1758 or 1759. Also the revision of old-style dates was not universal, so that he might have celebrated either March 7 or 18 of either year. There are four answers, Noah."

"Thoroly done, Cal. I'll accept all four, tho I prefer March 18, 1758, which also fell on a Saturday. Now for the Xmas Handicap, for which Barney the Bookie posted the following odds:

After all	even
Black Beauty	2 to 1
Corny Cob	3 to 1
Dot Dash	4 to 1
Evil Eye	5 to 1
Funny Fanny	6 to 1
Galloping Gal	7 to 1
Ho Hum	8 to 1
Isabella I	9 to 1
Jo Jo	10 to 1

Wagering shrewdly, Barney closed his books to net the same no matter which horse won. When he had to cancel the bets on a scratch, he reopened his books and balanced new wagers until he was assured an additional $2,986. All bets were one dollar, on the nose. Which horse was scratched?"

[*O'Kay (Otto H. S. Koch) alone agrees with the preferred answer, tho he doubts that 7th Avenue existed in 1752. Other Cal Klaters with acceptable answers were: James R. Bole, Coy W. Borders (who reconstructed the calendar), Isidore Knobbe (Joseph S. Lambie), Barney (Francis S. Harvey), H. Herbert Howe, and Robert W. Woodbury. Bole was concerned over the Saunders Almanac (Recreations in Mathematics, Licks, p. 118) which shows Saturday Sept. 2, 1752, followed by Thursday Sept. 14. This is disputed by Little (Dictionary of Dates) who notes the coronation of George II on Sunday June 11, 1727 (O.S.). Knobbe vouches also that Octimus Heptason, born in 1750, hadn't reached his 8th birthday when his brother Septimus celebrated his 7th. Figure that out.*]

MARCH—1752

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

APRIL

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

MAY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

JUNE

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

JULY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

AUGUST

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

SEPTEMBER

S	M	T	W	T	F	S
		1	2	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

OCTOBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

FROM KAL KLATER'S GREAT^5-GRANDFATHER'S CALENDAR

Planning Authority Created in St. Paul

A PROGRAM is being worked out for improving downtown St. Paul, Minn., with an eye to stimulating business and industry in the central business district after the war. The Minnesota Legislature has created a Central Business District Authority for St. Paul, consisting of nine members. Included in its powers are the taking over of property by condemnation, gift, purchase, or tax forfeiture and using it for the best interests of the city. It will set up parking lots or parking garages operated by the Authority or leased, and may operate a transportation system to carry customers from the parking garages to their final destination in the downtown loop district.

The Authority would have power to issue bonds up to $20,000,000 and to levy necessary taxes on the real estate within the central business district to support its activities—this district to be within the Downtown Circuit Traffic-Way, as laid out by the St. Paul Planning Board. The establishment of this district requires an affirmative vote of 60% of the affected property owners.

For the present the Downtown Authority will be permitted to expend $25,000 to make surveys and prepare detail plans and cost estimates which are to be submitted to the next legislature. The City Comptroller of St. Paul is the financial agent of the Authority, and the Commissioner of Public Works is a member of the Authority and would have charge of the improvements carried out in the district. Complete plans and estimates will be submitted to the Legislature in 1945 with the expectation that the Authority will then be permitted to proceed.

Brief Notes

MARKING the site of the first hydraulics laboratory under college auspices in the United States and honoring its builder—the late Mansfield Merriman, member of the Society and pioneer in the field of fluid mechanics—was the feature event at the Lehigh University Founder's Day celebration, which took place on October 18. The Society's representative at the ceremonies honoring Professor Merriman was Charles M. Spofford, M. Am. Soc. C.E.

* * * *

ANNOUNCEMENT has been made of the availability of the Proceedings of the Second Hydraulics Conference, Bulletin 27, Iowa Studies in Engineering, which may be obtained from the Department of Publications at the University of Iowa, Iowa City, Iowa, at a cost of $1.65 per copy. Many of the authors of the papers presented in this 350-page volume are members of the Society.

* * * *

LADIES attending the Atlanta Meeting were luncheon guests at the home of Commander and Mrs. L. F. Bellinger on

October 12. Afterward the colored maid gave voice to this earnestly expressed, deliberately considered opinion: "Dey sho is de most stylishest quality folks eveh ah sehved."

* * * *

Announcement has been made of the establishment of the University of Wyoming Research Institute, the first organization of its kind in the state. The purpose of the institute, which will operate in conjunction with the university, is to aid by scientific research in the discovery, development, and exploitation of the natural resources of the state. Another important function will be the study of special problems suggested by industrial firms. Dr. Henry G. Fisk has been appointed director of the institute.

* * * *

The Society has received a mimeographed copy of "Abstracts of Earthquake Reports from the Pacific Coast and the Western Mountain Region—October 1, 1942, to December 31, 1942." The information in this report has been collected by the Seismological Field Survey of the U.S. Coast and Geodetic Survey. Copies of the report may be obtained from the Supervisor, Western District, U.S. Coast and Geodetic Survey, 114 Customhouse, San Francisco, or from the Washington office of the Survey.

NEWS OF ENGINEERS

Personal Items About Society Members

Don C. Bowman, lieutenant (jg), U.S. Naval Reserve, has been awarded the Navy and Marine Corps Medal for "inestimable assistance" in action in the South Pacific.

Ray Campbell is now a lieutenant (jg) in the Civil Engineer Corps of the U.S. Navy. Prior to being commissioned he was city engineer and superintendent of the public works department of Laramie, Wyo.

George J. Nold, colonel, Corps of Engineers, U.S. Army, is one of two engineers recently awarded the Legion of Merit for "exceptionally meritorious conduct in the performance of outstanding duty." Colonel Nold, who is staff engineer for the Alaska Defense Command, received the honor for construction performance in building Alaska defense projects.

David McCoach, Jr., has been promoted from the rank of brigadier general in the Corps of Engineers, U.S. Army, to that of major general. He has been transferred from Washington, D.C., where he was assistant chief of engineers, to Fort Douglas, Utah. He will be commanding general of the Ninth Service Command.

Joseph Kryshak, recently commissioned a second lieutenant in the Army Air Corps, is at a West Coast base.

W. A. Zobel has been promoted from the rank of lieutenant commander in the Civil Engineer Corps of the U.S. Naval Reserve to that of commander. He is public works officer and resident officer in charge of construction at the Naval Air Station, Charleston, S.C.

Carl R. Rankin, formerly with the Southern California Edison Company, at Los Angeles, Calif., has accepted a position as consultant for the Pacific Gas and Electric Company, with headquarters in San Francisco. At present he is working on the company's Pit River project.

J. N. Wallace has resigned as district engineer for the West Virginia State Road Commission in order to accept a position as sales engineer for the tar and chemicals division of the Koppers Company, his territory to embrace all of West Virginia. Mr. Wallace is secretary of the West Virginia Section.

A. John Eveland announces the removal of his mining engineering practice from Reno, Nev., to the Russ Building in San Francisco, Calif.

C. L. Eckel is being promoted to the position of dean of engineering at the University of Colorado. He has been professor and head of the department of civil engineering.

R. R. Harris and A. R. Hollett, who are on the engineering staff of the Division of Health and Sanitation, Office of the Coordinator of Inter-American Affairs, have been promoted from the rank of captain to that of major. Other Society members in the Division to be promoted are J. C. Bumstead and J. W. Greenleaf, Jr., who are being advanced from the rank of first lieutenant to that of captain.

J. B. Converse, consulting engineer of Mobile, Ala., was recently elected president of the Alabama State Chamber of Commerce.

Paul M. Van Camp, of Southern Pines, N.C., is now in charge of plans and specifications for the construction of additional sewerage facilities to serve a federal housing project at Aberdeen, N.C.

John P. H. Perry, vice-president of the Turner Construction Company, New York, N.Y., was recently elected a trustee of Brooklyn Polytechnic Institute.

Samuel S. Baxter is now a captain in the Corps of Engineers, U.S. Army. Prior to receiving his commission, he was assistant director in the Philadelphia (Pa.) Department of Public Works.

Lawson D. Matter, district engineer for the Pennsylvania State Department of Health, with headquarters at Harrisburg, has been appointed Deputy State Water Supply Coordinator by the State Council of Defense. As such he will assist in organizing the water utilities of the state to keep water flowing during the war.

H. S. Mattimore, until lately engineer of tests for the Pennsylvania State Highway Department, is now working for the U.S. Navy. He is stationed at Wilmington, N.C.

Andrew J. Rominiecki, captain, U.S. Army, has been assigned to the Office of the Quartermaster General, Service of Installations Division, Memorial Branch, in Washington, D.C. He is in charge of the Plans, Requirements, and Fiscal Section of the Memorial Branch.

Christian F. Hildebrandt, formerly chief of the Architectural and Engineering Section of the Farm Security Administration, with headquarters at Upper Darby, Pa., has been commissioned a lieutenant (jg) in the Civil Engineer Corps of the U.S. Naval Reserve.

Milton F. Wagnitz, who is serving overseas with the Corps of Engineers, U.S. Army, has been promoted from the rank of major to that of lieutenant colonel. Before he received his commission Colonel Wagnitz was designing engineer in the City Engineer's Office at Detroit, Mich.

O. W. Crowley, for the past twenty years executive secretary of the Associated General Contractors of America, at Des Moines, Iowa, is now on leave of absence in Alaska, where he has been serving as project manager for the C. F. Lytle Company and Green Construction Company on the construction of the Alaska highway. He will continue as project manager on the maintenance contract, which these companies have been awarded for the coming year.

Roy M. Green, until lately president and manager of the Western Laboratories, Inc., at Lincoln, Nebr., was recently appointed chairman of the department of civil engineering at the University of Nebraska.

Walter C. Hutto has severed his connection as associate structural engineer for the Tennessee Valley Authority at Knoxville, Tenn., in order to become an instructor in civil engineering at Alabama Polytechnic Institute.

Robert Isham Randolph, colonel, Corps of Engineers, U.S. Army (retired), has joined the staff of the Chicago Ordnance District. In his new position he will specialize in the field of contract terminations as a civilian assistant to the chief of the Ordnance District's purchasing, termination, and renegotiation policy unit.

William H. Roberts has begun his new work as chairman of the Board of Standards and Appeals, State Department of Labor at Albany, N.Y. He was formerly commissioner of public works for the city of Rochester, N.Y.

A. M. Rawn, chief engineer and general manager of the Los Angeles County (Calif.) Sanitation District, was recently elected president of the Federation of Sewage Works Associations.

Charles Keller, brigadier general, Corps of Engineers, U.S. Army, who recently retired from active service, has been awarded the Legion of Merit for his outstanding service as district engineer of the Chicago District Engineer Office. At the time of his retirement General Keller, who is 75, was the oldest officer on duty in the U.S. Army.

Gilmore D. Clarke, John Carlyle Evans, Shortridge Hardesty, A. E. Howland, Richard V. Hyland, Sidney Shapiro, and George E. Spargo, New York engineers and members of the Society, are on the engineering staff selected by Robert Moses to help plan a postwar construction and development program for the Portland (Ore.) area. Mr. Moses is commissioner of the New York City Department of Parks.

Walter B. Little, assistant area engineer for the U.S. Engineer Office at Wenatchee, Wash., has been promoted from the rank of lieutenant to that of captain.

William A. D. Wurts was recently commissioned a captain in the Sanitary Corps of the U.S. Army. Prior to receiving his commission, Captain Wurts was assistant city engineer of Hartford, Conn.

Sterry J. Mahaffey has been appointed city manager of Durham, N.C., succeeding Henry A. Yancey, who resigned to become city manager of Greensboro, N.C. Mr. Mahaffey was previously civil engineer and manager of Henrico County, Virginia.

Herman L. Nelson was recently appointed county highway engineer for Madison County, Alabama.

Harry A. Raider, who for the past two years has been associated with the China Defense Supplies, Inc. (Lend-Lease for China) as an engineering consultant on highways, railways, and other matters pertaining to transportation in China, has been awarded a medal of honor by the Chinese government in recognition of his services. This is the first time the Ministry of Communications of China has awarded such an honor to an engineer.

George Wendell Phillips, until lately division engineer for the Alabama State Highway Department at Thomasville, Ala., has been appointed chief engineer of the consolidated bureaus of construction and maintenance in the highway department. He succeeds the late William Herzberg, who was chief construction engineer.

DECEASED

Harold James Manning Baker (Assoc. M. '08) principal engineer for the U.S. Engineer Office at Seattle, Wash., died on October 1, 1943. Mr. Baker, who was 65, had been in the Seattle district of the U.S. Engineer Office for more than forty years. Since 1919 he had been principal civilian engineer in the area. During this long period of service he directed the extensive improvements made by the War Department on the Columbia River between Kettle Falls and the mouth of the Snake River.

Edward Laramie Carpenter, Jr. (Assoc. M. '33) construction superintendent for Siems Drake Puget Sound, Seattle, Wash., died recently at the age of 43. For some years Mr. Laramie was with the Wallace Bridge and Structural Steel Company at Seattle and, later, was designing engineer and superintendent for the Puget Sound Bridge and Dredging Company. For the past two years he had been with Siems Drake Puget Sound.

Elbert Hermon Dresser (M. '19) chief engineer for the Duluth Missabe and Iron Range Railway at Duluth, Minn., died on May 21, 1943. He was 64. Mr. Dresser became connected with the Duluth, Missabe and Northern Railway (now the Duluth, Missabe and Iron Range Railway) in 1905 and had spent most of his career there in varying capacities—at one time he was president. During the first World War he served as a captain in the Corps of Engineers, U.S. Army.

John Fletcher Fairchild (Assoc. M. '95) retired civil engineer of River Edge, N.J., died at Harrington Park, N.J., on November 6, 1943, at the age of 75. From 1893 to 1932 Mr. Fairchild lived in Pelham, N.Y., and had an office in Mount Vernon. He was engaged on the construction of the Bronx River Parkway. A member of the New York National Guard since 1900, Mr. Fairchild served overseas in the first World War as a major in the 56th Pioneer Infantry.

George Higgins (M. '07) consulting engineer of Melbourne, Australia, died there on August 21, 1943, at the age of 87. Born in Ireland, Mr. Higgins was educated in Australia and spent most of his career there. He did engineering work for the governments of Victoria and New South Wales. From 1905 to 1922 he was on the staff of the University of Melbourne, and from 1923 to 1931 maintained a consulting practice. From the latter year on he devoted most of his time to lecturing and writing on economics.

Rolland Francis Lang (Jun. '40) first lieutenant, Corps of Engineers, U.S. Army, was killed in action in the Southwest Pacific on October 7, 1943. He was 29. Lieutenant Lang was a graduate of South Dakota State College, where he served as instructor before joining the faculty of Michigan College of Mining and Technology in 1940. A reserve officer, he was called into service as a second lieutenant in July 1942. At the time of his death he was attached to an amphibian engineer regiment.

George Kerr Little (M. '22) vice-president and manager of the Baker Towboat Company, Inc., Tuscaloosa, Ala., died on October 27, 1943. Mr. Little, who was 68, had been with the Baker Towboat Company since 1923. Earlier in his career (1900 to 1918) he was in charge of various works of river and harbor improvement for the U.S. Engineer Office. During this period he was also engaged on the Muscle Shoals development. From 1919 to 1923 Mr. Little was superintendent of the National Contract Company on Ohio River contracts.

John Claredon McClure (M. '11) retired railroad official of Altadena, Calif., died in October 1943. Early in his career Mr. McClure was with the Pennsylvania Railroad and, later, was assistant division engineer for the St. Louis and San Francisco Railway. In 1904 he became maintenance engineer of the Southern Pacific in Mexico, later serving as assistant general manager and assistant to the president. He retired in 1925. One of Mr. McClure's accomplishments was the construction of the Los Angeles Terminal Railway between Pasadena and Los Angeles.

Edwin Charles Swezey (M. '06) of Salt Point, N.Y., died on October 5, 1943, at the age of 72. From 1906 to 1919 Mr. Swezey was general superintendent of work and engineer member of the Brooklyn Grade Crossing Commission, working on the abolition of grade crossings. He then retired to a farm, though he continued to come to the city several days each week to engage in real estate work.

Enrique Augusto Touceda (M '00) widely known authority on malleable iron and professor emeritus at the Rensselaer Polytechnic Institute, died at his home in Albany, N.Y., on October 21, 1943. His age was 81. A native of Cuba, Professor Touceda was educated here and for thirty years served as professor at his alma mater, Rensselaer Polytechnic Institute. For the past forty years he was a director of the Touceda (metallurgical) Laboratories in Albany, where he also maintained a consulting practice.

Alexander Milton Vance (M. '34) of Austin, Tex., died on July 12, 1943, at the age of 72. From 1898 to 1911 Mr. Vance was engaged in railroad work; from 1911 to 1919, he was engineer and general superintendent for the Kaw Paving Company at Topeka, Kans.; from 1921 to 1928, engineer and general superintendent for Smith Brothers, Inc.; and from 1929 to 1930, vice-president and general manager of the Southern Paving Company at Dallas, Tex. More recently Mr. Vance was state reclamation engineer of Texas.

Samuel Lamson Wonson (M. '20) assistant chief engineer for the Missouri Pacific Railroad at St. Louis, Mo., died in October 1943. Mr. Wonson, who was 66, had been with the Missouri Pacific since 1910, serving successfully as assistant bridge engineer, bridge engineer, and assistant chief engineer. His earlier experience (1902 to 1907) was with the American Bridge Company, and from 1907 to 1910 he was assistant bridge engineer for the Mexican Railway.

J. Bodine Wright (M. '05) of Buck Hill Falls, Pa., died there on October 13, 1943, at the age of 77. For many years Mr. Wright maintained an architectural engineering practice in New York. He had also been structural engineer for McKenzie, Voorhees and Gmelin, of New York, and principal assistant to the chief engineer for James Stewart and Company. Blindness forced his retirement eight years ago.

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Applications for Admission or Transfer

Condensed Records to Facilitate Comment from Members to Board of Direction

January 1, 1943

NUMBER 1

The Constitution provides that the Board of Direction shall elect or reject all applicants for admission or for transfer. In order to determine justly the eligibility of each candidate, the Board must depend largely upon the membership for information.

Every member is urged, therefore, to scan carefully the list of candidates published each month in CIVIL ENGINEERING *and to furnish the Board with data which may aid in determining the eligibility of any applicant.*

It is especially urged that a definite recommendation as to the proper grading be given in each case, inasmuch as the grading must be based upon the opinions of those who know the applicant personally as well as upon the nature and extent of his professional experience. Any facts derogatory to the personal character or professional reputation of an applicant should be promptly communicated to the Board.

Communications relating to applicants are considered strictly confidential.

The Board of Direction will not consider the applications herin contained from residents of North America until the expiration of 30 days, and from non-residents of North America until the expiration of 90 days from the date of this list.

MINIMUM REQUIREMENTS FOR ADMISSION

GRADE	GENERAL REQUIREMENT	AGE	LENGTH OF ACTIVE PRACTICE	RESPONSIBLE CHARGE OF WORK
Member	Qualified to design as well as to direct important work	35 years	12 years	5 years RCM*
Associate Member	Qualified to direct work	27 years	8 years	1 year RCA*
Junior	Qualified for sub-professional work	20 years	4 years	
Affiliate	Qualified by scientific acquirements or practical experience to cooperate with engineers	35 years	12 years	5 years RCM*

* In the following list RCA (responsible charge—Associate Member standard) denotes years of responsible charge of work as principal or subordinate, and RCM (responsible charge—Member standard) denotes years of responsible charge of IMPORTANT work, i.e., work of considerable magnitude or considerable complexity.

APPLYING FOR MEMBER

BOOSS, GEORGE FREDERICK, Summit, N.J. (Age 40) (Claims RCA 7.1 RCM 6.4) July 1941 to date Structural Engr., Ebasco Services, Inc., New York City; previously Asst. Engr. (Designer), Board of Water Supply, New York City.

BRENNAN, WILLIAM ANDERSON (Assoc. M.), Brooklyn, N.Y. (Age 47) (Claims RCA 9.8 RCM 7.1) July 1941 to date Inspector, Plant Protection, Internal Security Div., U.S. Army; previously Project Engr., Brooklyn Navy Yard; in private practice as Cons. Engr.; Deputy Commr. and Commr., White Plains Comm. of Public Safety.

BROWN, THOMAS GORDON, Santa Fe., N.Mex. (Age 40) (Claims RC 17.1 D 2.3) Oct. 1942 to date 1st Lieut., Corps of Engrs., U.S. Army; previously with New Mexico Highway Dept., in various capacities.

DONLEY, DAVID EDWARD (Assoc. M.), Salt Lake City, Utah. (Age 40) (Claims RCA 5.0 RCM 8.1) Jan. 1941 to date with Corps of Engrs., U.S. Army, at present being Lt. Col., Utah Ordnance Plant; previously Hydr. Engr., War Dept., Washington, D.C.; Hydr. Engr., TVA.

ERICKSON, ARCHIE MILTON (Assoc. M.), New York City. (Age 37) (Claims RCA 2.6 RCM 7.0) 1932 to date Faculty Member, School of Architecture, New York Univ., being Asst. Prof.; also in private practice as Cons. Engr., and (since June 1940) member of firm, Wilcox and Erickson, Cons. Engrs.

HANRAHAN, FRANCIS JOHN (Assoc. M.), Washington, D.C. (Hge 41) (Claims RCA 1.2 RCM 6.2) Feb. 1937 to date Structural Engr., National Lumber Manufacturers Association and Timber Eng. Co.

HEIDENREICH, EDWIN LEE, JR., New York City. (Age 52) (Claims RCA 3.0 RCM 27.1) Jan. 1942 to date Quarry Supt., Arundel Corporation, Consolidated Eng. Co., and Hardaway Contr. Co., Baltimore; previously in private practice as Cons. Engr., Cincinnati, Ohio; Chf. Engr., New York Trap Rock Corporation, New York City.

HODOSH, JACOB, New York City. (Age 50) (Claims RCM 19.0) 1936 to date Sec. Engr., New York City Tunnel Authority, Queens Midtown and Brooklyn–Battery Tunnels.

KIRK, KARL QUILL, Chattanooga, Tenn. (Age 64) (Claims RCA 0.7 RCM 18.6) 1925 to date Engr., Mark K. Wilson Co., Gen. Bldg. Contr.

KOEBIG, ADOLF HEINRICH, JR. (Assoc. M.), Los Angeles, Calif. (Age 56) (Claims RCA 19.9 RCM 8.1) 1910 to date member of firm, Koebig & Koebig, Cons. Engrs.

McNAMEE, JEFF JACKSON, Bethesda, Md. (Age 40) (Claims RCA 2.3 RCM 15.1) July 1941 to date Administrative Asst.-Progress Engr., Bureau of Yards and Docks, Navy Dept., Washington, D.C.; previously Asst. Engr., Southern Ry. System.

MUSSETTER, WILLIAM, Havana, Ill. (Age 46) (Claims RCA 1.4 RCM 19.8) July 1940 to Oct. 1941 Senior Partner with J. W. Hamilton, and Oct. 1941 to date sole owner, contracting business, Omaha, Nebr.; previously with U.S. Coast & Geodetic Survey in various capacities.

PEIGHTAL, PERCIVAL LYLE, Sioux City, Iowa. (Age 36) (Claims RCA 6.2 RCM 3.2) April 1942 to date Asst. Engr., Buell-Winter-Beuttler, Archt.-Engr.; previously with North Dakota Highway Dept., as Div. Maintenance Engr. and Res. Engr.

RAFFIN ISIDOR DORR, San Francisco, Calif. (Age 52) (Claims RCA 6.0 RCM 23.1) July 1926 to date Gen. Mgr. and Chf. Engr., Barrett & Hilp.

REID, LLOYD BROWNLEE, East Lansing, Mich. (Age 41) (Claims RCA 2.9 RCM 16.3) July 1933 to date with Michigan Highway Dept., as Assessment Dist. Engr., Asst. Maintenance Engr., Director of Finance, and (since Jan. 1941) Deputy Commr. and Business Mgr.

RICH, HENRY MERRITT (Assoc. M.), Sacramento, Calif. (Age 53) (Claims RCA 8.0 RCM 15.6) May 1912 to date with Corps of Engrs., U.S. Army, in various capacities, after 1934 being Asst. to Head of Operations Div., Head of Operations Div., and (since Oct. 1942) with Gen Staff to Dist. Engr.

RICHARDSON, ROBERT BRUCE, Baton Rouge, La. (Age 41) (Claims RCA 9.8 RCM 10.2) 1921 to date with Louisiana Highway Comm., in various capacities, since 1940 being Constr. and Maintenance Engr.

RIZZI, CHARLES ALFRED (Assoc. M.), Scarsdale, N.Y. (Age 38) (Claims RCA 6.5 RCM 8.0) Sept. 1925 to date with R. E. Carrick Co., Constrs., as Asst. to Chf. Estimator and Engr., Chf. Estimator and Engr., Secy., and (since 1937) Executive Vice-Pres. in charge of New York Office; since Jan. 1942 also Executive Head, Concrete Dept., Thompson-Starrett Co., Inc.

ROONEY, WILLIAM FRANCIS, New York City. (Age 44) (Claims RCM 21.0) Nov. 1920 to Dec. 1925 and Oct. 1941 to date Fire Protection Engr., Johnson & Higgins; in the interim Operating Mgr., F. L. Roberts & Co., Springfield, Mass., and with Tide Water Associated Oil Co., New York City.

ROOT, WALTER HAROLD, Ames, Iowa. (Age 54) (Claims RCA 2.0 RCM 29.5) June 1913 to date with Iowa Highway Comm., as Dist. Engr., and (since Sept. 1919) Engr. of Road Maintenance.

SMYTH, WILLIAM HARRIS, New York City. (Age 52) (Claims RCA 1.0 RCM 5.0) April 1921 to July 1941 in Jugoslavia as Owner and Mgr. of W. H. Smyth, Belgrade, at present not on engineering.

SYMNS, SAMUEL YOUNG (Assoc. M.), Cuyahoga Falls, Ohio. (Age 37) (Claims RCA 2.1 RCM 6.7) Sept. 1940 to date Senior Civ. Engr., Wilbur Watson & Associates, Ravenna (Ohio) Ordnance Plant; previously with The Firestone Plantations Co. in various capacities, finally as Staff Engr., Akron, Ohio.

WATTINGER, RALPH HENRY, Goldsboro, N.C. (Age 39) (Claims RCM 13.3) Jan. 1941 to date Gen. Supt., Grannis, Higgins, Thompson & McDavitt Co., Contrs.; previously Supt. of Constr. with A. Farnell Blair, Contr., Decatur, Ga.

WAUGH, JAMES HARRY, Baton Rouge, La. (Age 40) (Claims RCA 3.7 RCM 10.3) June 1929 to date with Louisiana Highway Comm., as Instrumentman, Res. Engr., Dist. Constr. Engr., and (at present) Road Design Engr., Dept. of Highways.

WILCOXEN, LEWIS CLARK (Assoc. M.), Detroit, Mich. (Age 50) (Claims RCA 11.2 RCM 5.0) July 1926 to date Asst. Civ. Engr., City Engrs.'s Office.

APPLYING FOR ASSOCIATE MEMBER

ARISON, SOLOMOM BENJAMIN, Brooklyn, N.Y. (Age 52) (Claims RCA 7.5 RCM 15.2) Oct. 1936 to date Asst. Engr. (Designer), Grade 4, and Civ. Engr. (W.S.) Board of Water Supply, New York City.

BATES, ABEL JACOB (Junior), Webster, Mass. (Age 33) (RCA 6.4 RCM 1.2) Nov. 1941 to date Field Engr., Sanders Eng. Co., Robertson-Henry Co., Portsmouth, N.H.; previously Asst. Engr., C. T. Main, Inc.; Asst. Project Engr., Worcester Geodetic Survey; with Massachusetts Geodetic Survey.

BATES, FRANCIS, JR. (Junior), Los Angeles, Calif. (Age 33) (Claims RCA 2.3) Aug. 1940 to date with Vega Aircraft Corporation as Layout Draftsman, and (since Aug. 1942) Design Group Engr.; previously with Metropolitan Water Dist. of Southern California in various capacities, finally as Asst. Engr.

BERNHARDT, CARL JOSEPH, Jamestown, N.Y. (Age 37) (Claims RCA 5.2) Dec. 1933 to date with New York State Dept. of Health, as Jun. San. Engr., and (since Oct. 1937) Dist. San. Engr.

BERRY, JAMES WATKINS, Nashville, Tenn. (Age 38) (Claims RC 4.9) July 1933 to date with U.S. Engr. Office in various capacities, since April 1942 as Associate Engr.

BRILL, ROYSE HARLAN (Junior), Butte, Mont. (Age 32) (Claims RCA 2.2) April 1938 to Feb. 1939 and June 1940 to date with the Montana Power Co., Butte, at present as Field Engr.; previously Expert Witness and Hydrographer; in the interium Asst. Engr., PWA, Omaha, Nebr., and Constr. Engr., Mount Haggin Land & Livestock Co., Anaconda, Mont.

BURLESON, ROBERT BYRD, Gadsden, Ala. (Age 40) (Claims RCA 8.7) Nov. 1922 to date with Alabama Highway Dept., in various capacities and (since March 1939) Res. Engr.

CASSELL, DAVID BENNETT, JR. (Junior), Los Angeles, Calif (Age 30) (Claims RCA 6.3) Feb. 1936 to date with Bates & Rogers Constr. Corporation, since Nov. 1940 as Chf. R. R. Material Engr. and Chf. Expediter.

CORUM, WILLIAM THOMAS (Junior), Yuma, Ariz. (Age 33) (Claims RCA 4.1) July 1942 to date

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Cox, Hayward Carlton, Atlanta, Ga. (Age 42) (Claims RCA 9.7) Jan. 1942 to date Engr., War Dept., Corps of Engrs., Div. Engr's. Office; previously with Richmond, Fredericksburg & Potomac R.R. Co.

Degenkolb, Henry John (Junior), San Francisco, Calif. (Age 29) (Claims RCA 4.0 RCM 1.0) Oct. 1940 to date Structural Engr. for J. J. Gould, and Asst. Tech. Director for Timber Test Study; previously Designer for L. H. Nishkian, Cons. Structural Engr., L. S. Rosener, American Smelting and Refining Co., etc.

Dickey, Walter Linnaeus, Pearl Harbor, Hawaii. (Age 35) (Claims RCA 4.2 RCM 2.0) May 1941 to date with U.S. Navy, as Asst. Officer, Design Sec., then on construction work, Naval Air Station, Midway Island, and (at present) with Dist. of Public Works, Navy Yard, Pearl Harbor; previously Structural Designer, Taylor & Taylor, Los Angeles, Calif.

Dickinson, Vernon Dayton, Honolulu, Hawaii. (Age 33) (Claims RCA 5.5) July 1941 to date with U.S. Engrs., as Senior Eng. Aide, and (since Jan. 1942) Asst. Engr.; previously Senior Eng. Aide, Survey Office, Pearl Harbor Navy Yard; Jun. Engr., U.S. Navy; Recorder, U.S. Geological Survey.

Elwin, Elmer Hill, (Junior), Seattle, Wash. (Age 30) (Claims RCA 5.5 RCM 0.3) Sept. 1942 to date 1st Lieut., Corps of Engrs., U.S. Army; previously with U.S. Engineer Office, as Tech. Constr. Inspector and Office Engr.; with U.S. Fish & Wildlife Service.

Fairhall, William Markley, Chicago, Ill. (Age 32) (Claims RCA 9.5) May 1942 to date 1st Lieut., Corps of Engrs., U.S. Army, acting as Area Engr.; previously Engr., Danville San. Sewer Dist.

Forbis, Johnson Linville (Junior), St. Louis, Mo. (Age 31) (Claims RCA 5.4 RCM 1.6) June 1941 to date Structural Inspector and Field Engr., Stone & Webster Eng. Corporation; previously with WPA of Oklahoma.

Graeser, Henry Jacob, Jr,. Washington, D.C. (Age 27) (Claims RCA 1.5) June 1941 to March 1942 Asst. Engr. of Water Supply, and March 1942 to date Associate Engr., Water and Sewage Unit, Repairs and Utilities Branch, Chf. Engr.'s Office, Washington, D.C.; 1st Lieut., and at present Capt., San. Corps, A.U.S.

Huie, Samuel Sze Lien (Junior), Richmond Hill, N.Y. (Age 32) (Claims RCA 4.1) April 1941 to date Engr., Del Balso & Sprague, Gen. Contrs.; previously with Madigan-Hyland, Long Island City, N.Y., in various capacities, finally as Gen. Inspector.

Hyde, Harlow, Jr., Indianapolis, Ind. (Age 35) (Claims RCA 4.7) July 1942 to date 1st Lieut., Air Corps, U.S. Army; previously Asst. Engr. with Charles H. Hurd, Cons. Engr.; Supervisor, Indiana-Kentucky Dist., CCC; Engr., J. C. O'Connor & Sons, Fort Wayne, Ind.

Kaltenbach, Charles Joseph, Miami, Fla. (Age 52) (Claims RCA 16.5) Oct. 1941 to date Associate Engr., U.S. Engr. Office; previously with State Road Comm. of West Virginia as Draftsman and Jun. Engr.; Engr., Wheeling (W.Va.) Traction Co.

Kennon, Frank Walter, Tacoma, Wash. (Age 36) (Claims RCA 1.9) July 1941 to March 1942 Jun. Hydr. Engr., and Sept. 1942 to date Asst. Hydr. Engr., U.S. Geological Survey; in the interim Jun. Engr., U.S. Bureau of Reclamation; previously Public Land Surveyor, U.S. Gen. Land Office.

Krasnick, Max Aaron, Pine Bluff, Ark. (Age 38) (Claims RCA 8.7 RCM 0.9) Feb. 1942 to date Asst. Progress Engr., Sanderson & Porter, Pine Bluff (Ark.) Arsenal; previously Progress Engr., Albert Kahn, Inc., Detroit, Mich.; Cost Engr., Healy Subway Constr. Corporation, Chicago, Ill.; and with Panama Constrs., Inc., Cocoli, Panama, Canal Zone; Inspector, Dept. of Public Works, Detroit, Mich.

McCracken, Winfield A, Houston, Tex. (Age 40) (Claims RCA 0.5 RCM 5.8) April 1941 to date Structural and Civ. Engr., Frederic R. Harris; previously Structural Engr., Helland & Draught; Structural Engr. and Bldg. Supt. for various architects; Plant Engr., Fluor Corporation.

McGowan, Forrest Hall, Ancon, Canal Zone. (Age 40) (Claims RCA 4.9 RCM 5.5) July 1941 to date on work for Corps of Engrs., U.S. Army, in Canal Zone, since June 1942 being Acting Chf. of Equipment Sec. (P-5), Panama Engr. Div.; previously Engr. and Supt. of Constr., Supt. of Constr., McDougald Constr. Co., Atlanta, Ga., and for FWA; WPA, Macon, Ga., Dist.

McKamey, Jack B, Dandridge, Tenn. (Age 30) (Claims RCA 4.0) April 1934 to date with TVA as Jun. Inspector of Constr., Jun. Materials Engr., Jun. Civ. Engr., Asst. Civ. Engr., and (since June 1941) Associate Civ. Engr.

Marquez, Danny Cajulis, Portland, Ore. (Age 36) (Claims RCA 4.3) Dec. 1938 to date with Bonneville Power Administration, as Asst. Structural Engr., and (since Sept. 1941) Associate Structural Engr.; previously Eng. Draftsman, U.S. Forest Service, Albuquerque, N.Mex.

Menefee, James Hendrix (Junior), Galveston, Tex. (Age 28) (Claims RCA 4.6) June 1941 to June 1942 Asst. San. Engr., and June 1942 to date Associate San. Engr., War Department, Camp Wallace, Tex.; also E.S.M.D.T. Instructor, Texas Agricultural & Mechanical Coll.; previously Dist. and County Public Health Engr., Missouri State Board of Health, Jefferson City, Mo.

Neale, William Frederick, Middle River, Md. (Age 30) (Claims RCA 6.5) Oct. 1942 to date Res. Engr., Housing Eng. Co., Aberdeen; previously Res. Engr., T. S. Cassedy, Cons. Engr.; with Pennsylvania R.R. Co., in various capacities; Field Engr., U.S. Army, Constr. Q.M., Fort Dix, N.J.

Palmer, Aubrey Edwin (Junior), Hopewell, Va. (Age 30) (Claims RCA 4.5) Jan. 1941 to date Structural Designer with The Solvay Process Co., and (since Aug. 1941) with Atmospheric Nitrogen Co.; previously Jun. Engr., U.S Engrs. Office; Structural Draftsman, Carbide & Chemicals Corporation.

Porterfield, William Alexander, Canton, Ohio. (Age 53) (Claims RCA 25.3) Feb. 1921 to date Vice-Pres., Union Metal Manufacturing Co.

Price, Reginald Carrier, Silver Spring, Md. (Age 31) (Claims RCA 1.9) Feb. 1941 to date with National Resources Planning Board, Washington, D.C., since Aug. 1942 Hydr. Engr. Public Works Project Review Sec.; previously with Office of Land Use Coordination, U.S. Dept. of Agriculture, Washington, D.C.; Dist. San. Engr., Wisconsin Board of Health, Sparta, Wis.

Reutter, John G. (Junior), Clayton, N.J. (Age 32) (Claims RCA 2.0) April 1940 to date Asst. Chf. Engr., Hungerford & Terry, Inc.; previously Engr., National Memorial Park.

Rockwell, Harvard Seldon, Midland, Mich. (Age 51) (Claims RCA 18.2) May 1942 to date Concrete Designer-Structural Engr., The Austin Co.-Defense Plant Corporation; previously in private practice.

Sawyer, Robert Kenneth (Junior), Camp Douglas, Wis. (Age 31) (Claims RCM 1.5) July 1941 to date with U.S. Army, as Constr. Quartermaster, and (at present) Area Engr.; previously Instructor in Eng. Mechanics, Univ. of Alabama; Research Asst. Highway Eng., Iowa State Coll.

Schmidt, Milton Otto, Pittsburgh, Pa. (Age 32) (Claims RCA 2.1) Sept. 1941 to date Instructor, Dept. of Civ. Eng., Carnegie Inst. of Technology; previously Jun. Asst. Highway Engr., Wisconsin Highway Comm., Milwaukee; Jun. Hydr. Engr., U.S. Geological Survey; Asst. Res. Engr., PWA, Chicago, Ill.; Instructor in Civ. Eng., Kansas State Coll., Manhattan, Kans.

Schrader, Raymond Augustus, Seattle, Wash. (Age 31) (Claims RCA 9.5) Sept. 1940 to date Constr. Engr., The Austin Co.; previously Project Engr., The Bonneville Project; Constr. Engr., G. H. Buckler Co.

Schulz, Walter George (Junior), Sacramento, Calif. (Age 31) (Claims RCA 5.9 RCM 1.2) April 1938 to date Asst. Hydr. Engr., California Div. of Water Resources.

Steele, Thomas Lindsey, Denver, Colo. (Age 32) (Claims RCA 2.1 RCM 1.9) Oct. 1938 to date with Water Utilization Planning Service, U.S. Dept. of Agriculture, as Asst. Water Planning Analyst, Associate Water Planning Analyst, and (since April 1942) Water Planning Analyst.

Steelman, Courtland, Terre Haute, Ind. (Age 42) (Claims RCA 14.2) Oct. 1933 to date with E. I. du Pont de Nemours & Co., Wilmington, Del., in various capacities, since May 1942 being Field Project Mgr. at Wabash River Ordnance Works.

Strong, Charles Henderson (Junior), Tacoma, Wash. (Age 33) (Claims RCA 4.0 RCM 1.1) Oct. 1941 to date with Strong & Macdonald, Inc., Contrs., Corvallis, Ore., as Asst. Supt., and (at present) Chf. Engr.; previously Estimator, MacDonald & Kahn, Inc., Contrs., San Francisco, Calif.

Sutherland, William Taylor, Nashville, Tenn. (Age 32) (Claims RCA 4.0 RCM 1.6) May 1942 to date 1st Lieut., Corps of Engrs., Office of Area Engr., Basic Flying School, Courtland, Ala.; previously with Clarence Sutherland Co. as Gen. Supt. of cabinet makers; also Lecturer, Vanderbilt Univ.

Thompson, William Erwin, Jr., Rapid City, S.Dak. (Age 32) (Claims RCA 1.8) June to Sept. 1941 and June 1942 to date in private practice; Sept. 1938 to June 1942 Instructor in Civ. Eng., South Dakota State School of Mines.

Thornton, Charles Victor (Jun.), Alexandria, Va. (Age 27) (Claims RCA 3.1 RCM 2.3) Sept. 1940 to date Chf. Engr., Southern Iron Works, Inc.; also Structural Engr., Sligo Park Church, Takoma Park, Md.; previously Engr. and Dist. Engr., Truscon Steel Co.

Thurner, George, Wisconsin Dells, Wis. (Age 31) (Claims RCA 3.5) June 1941 to date with U.S. Army as Chf. Eng. Draftsman, Corps of Engrs., Camp Grant, Ill., and (since April 1942) Sec. Engr., Area Engr., Badger Ordnance Works; previously with City of Milwaukee, Wis.

Wilson, Mark Leonard, New Brighton, N.Y. (Age 49) (Claims RCA 13.6) 1941 to date Chf. Draftsman for Contrs., Naval Supply Base, Bayonne, N.J.; previously Chf. Archt. and Head of Archt. Dept., Tilghman Moyer Co., Allentown, Pa.

Zach, Leon Henry, Washington, D.C. (Age 47) (Claims RCA 10.8 RCM 8.0) March 1941 to date with Site Planning Unit, Eng. Branch, Constr. Div., War Dept., as Special Asst. to Chf. and (since May 1941) Chf.; previously with Olmsted Bros., Landscape Archts. and City Planners, Brookline, Mass., as Designer and Gen. Office Asst., and (later) member of firm.

APPLYING FOR JUNIOR

Forzley, Victor George, Worcester, Mass. (Age 24) Feb. 1942 to date Asst. Chf. Structural Designer, Chas. T. Main Co., Boston, Mass.

Grantham, George Richard, Storrs, Conn. (Age 26) Sept. 1942 to date Instructor in Civ. Eng., Univ. of Connecticut, previously Graduate Asst. and graduate student in San. Eng., Illinois Inst. of Technology, and in Civ. Eng., Michigan State Coll.

Gunderson, Lynn Henry, St. Paul, Minn. (Age 28) July 1937 to date with Portland Cement Association, as Trainee, Office Engr., Engr., and (since April 1942) Structural Field Representative.

Johnson, Joseph Hartwell, Portland, Ore. (Age 28) July 1941 to date with U.S. Engr. Office, Portland, Ore., as Civil Eng. Aide and (since March 1942) Senior Civil Eng. Aide; previously Asst. Eng. Aide, Photogrammetry (SP-4), Jun. Eng. Aide, and Draftsman, Universal Drafting Machine.

MacKay, Thomas Robert, Ithaca, N.Y. (Age 25) (Claims RCA 0.3) Jan. 1941 to date with Water Resources Branch, U.S. Geological Survey, as Jun. Engr., and (since Aug. 1942) Asst. Engr.; previously Eng. Aide, Flood Control Div., Federal Power Comm.

Saxe, Nathaniel Charles, Care, Postmaster, New York City. (Age 30) (Claims RCA 3.3) March 1942 to date Res. Engr. for contractors on air-base construction; previously with Combustion Eng. Co., New York City; Asst. Res. Engr., Johnson, Drake & Piper, on Belt Parkway.

1941 GRADUATE

N.C. STATE COLL.
(B.C.E.)

	Age
Jennings, Hubert Ernest	(27)

1942 GRADUATES

UNIV. OF CALIF.
(B.S. in C.E.)

Hampton, James Edward	(23)
Hants, Ralph Leland	(21)
Larson, Ewald Claus	(23)
McKinney, Daniel George	(23)
Ospina, Carlos Sebastian	(22)
Schutte, Wilson Walter	(22)
Seppa, Karl Einar	(21)

UNIV. OF ILL.
(B.S. in C.E.)

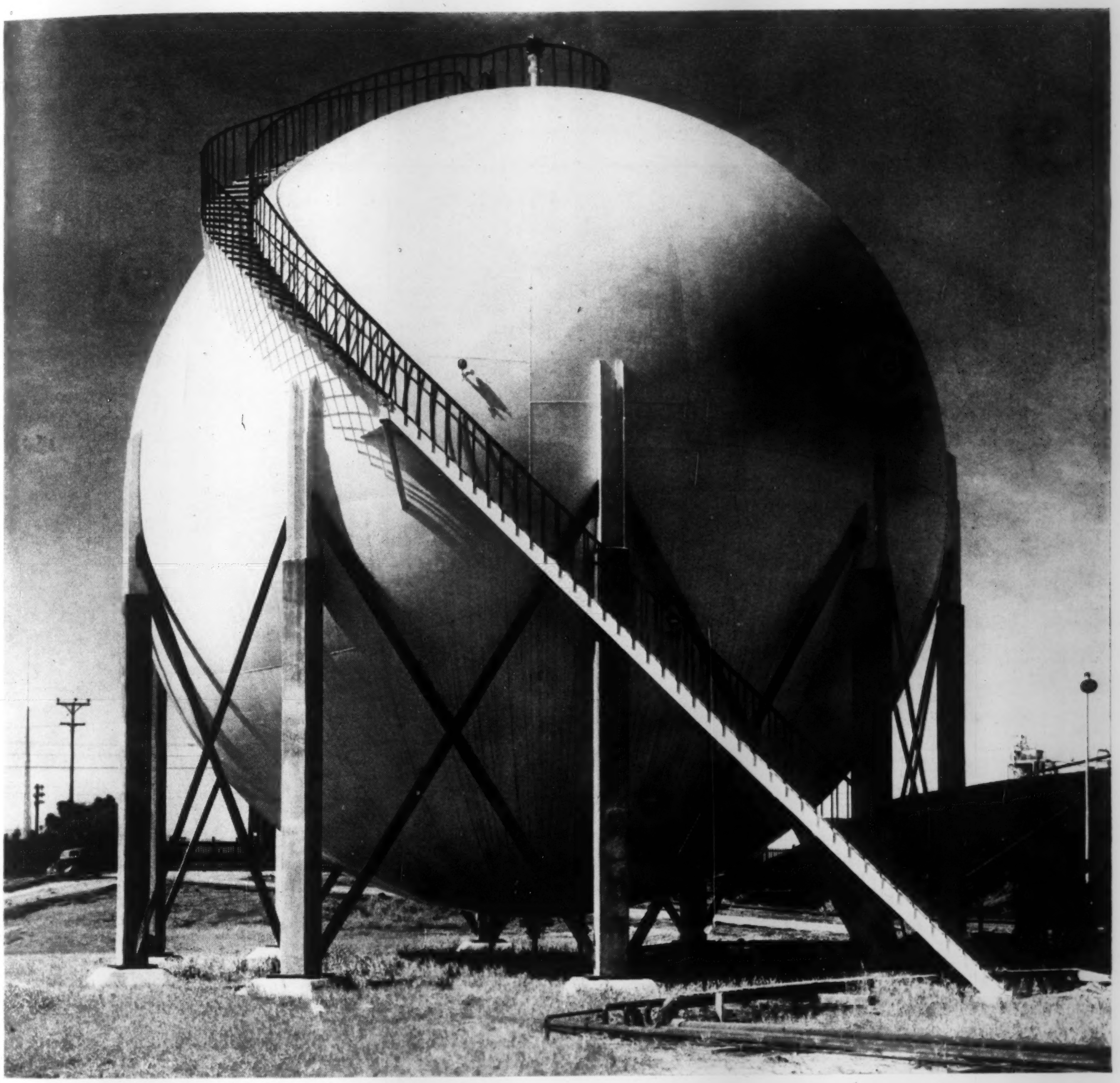
Ehrgott, Robert William	(22)
Fear, Milo Clyde	(22)
Tigrak, Mehmet Fuat	(31)
Uyanik, Mehmet Ensar	(26)

LEHIGH UNIV.
(Ph.D.)

Ondra, Otakar	(28)

MICH. COLL. OF MIN. & TECH.
(B.S.)

Allen, Sidney	(23)



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Houston.................5628 Clinton Drive
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COLL. OF CITY OF N.Y.
(B.C.E.)

KANE, DAVID	(28)
SIEMS, VALENTINE BERNARD, JR.	(22)

NEW YORK UNIV.
(B.C.E.)

WESSLEY, STEPHEN EUGENE, JR.	(22)

STANFORD UNIV.
(A.B.)

DILDINE, ALFRED CARR	(23)

UNIV. OF WASH.
(B.S. in C.E.)

LAWRENCE, JAMES FRANKLIN	(24)

UNIV. OF WIS.
(B.S. in C.E.)

SANDNER, FRANK XAVIER, JR.	(24)

The Board of Direction will consider the applications in this list not less than thirty days after the date of issue.

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MEN AVAILABLE

OFFICE OR STRUCTURAL ENGINEER; Jun. Am. Soc. C.E.; C.E. graduate; 9 years' progressive experience in varied structural design, estimating, and layout, and in supervisory capacity in office of construction engineer on heavy construction projects. Desires position with contractor or engineering firm where similar responsibilities may be assumed. South preferred. Available about January 1. C-952.

RECENT CIVIL ENGINEERING GRADUATE; Jun. Am. Soc. C.E.; desires immediate employment in field or office work; 6 months' experience as junior structural engineer, and 3 months' experience in building construction before college graduation. Leaving company not in essential war work. Will go anywhere but prefer the South. C-953.

INSTRUCTOR; Assoc. M. Am. Soc. C.E.; desires position as assistant professor of surveying or sanitary engineering; several years' teaching surveying and drawing; master's degree and some teaching in sanitary engineering. C-954.

EXECUTIVE ENGINEER; M. Am. Soc. C.E.; 44; Tulane University, B.E. (civil engineering); broad experience, municipal construction, sewers, roads, streets, buildings, reinforced concrete, Army camps; 16 years' foreign experience in China and Mexico. Languages, Chinese, Spanish, and French. Now employed, principal industrial specialist, Government department, Washington; desires more active work, preferably abroad—Africa, Asia, South America. Excellent physical condition. Available on short notice. C-955.

POSITIONS AVAILABLE

GRADUATE CIVIL ENGINEER who has had a good educational course in soil mechanics as well as some practical experience in this work. A laboratory man is not wanted. Some knowledge of foundation design would be helpful. Temporary. Salary, $2,000–$2600 a year. Location, New York, N.Y. W-136.

MECHANICAL OR CIVIL ENGINEERS, young, who have had some experience on the construction or maintenance of petroleum refineries. Permanent. Salary open. Location, New York, N.Y. W-764.

SUPERVISING ENGINEERS, civil, to coordinate activities of men doing inspection of construction projects, primarily industrial buildings. Will also approve invoices and payrolls. Salary, $2,600–$3,800 a year. Location, anywhere in United States. Headquarters, Washington, D.C. W-787.

RECENT GRADUATE CIVIL ENGINEERS for use in field construction and general layout work. Will take a few with construction experience. Salary, $2,080–$3,380 a year. Location, South. W-812.

FIELD ENGINEER experienced in industrial plant construction, both building and mechanical equipment. Must be able to interpret drawings and designs and layout work in the field. Salary, $3,900 a year. Headquarters, Ohio. W-1025.

ENGINEERS. (*a*) Civil Draftsmen. (*b*) Civil Engineer, first-class soil analysis man, to interpret soil analyses, take charge of sampling, and design subbase for runways and highways, based on results thereof. Location, Maryland. W-1220.

CIVIL ENGINEER for field work on the erection of utilities. Must be able to do minor design for field changes and layout work. Temporary. Salary, $4,000–$4,600 a year. Location, Virginia. W-1265.

OFFICE ENGINEER experienced in steel and concrete design and, preferably, some piping. Knowledge of water supply desirable. Salary, $4,500–$4,800 a year. Location, Kentucky. W-1301.

SANITARY ENGINEER with experience in sanitary and public health, particularly on field work on inspection and investigation. Must be a resident of New York, N.Y. Salary, $4,250 a year. Location, New York, N.Y. W-1455.

COMMISSIONED OFFICERS for the United States Naval Reserve. Should be civil engineers with experience in field construction. Headquarters, New York, N.Y. W-1559.

DRAFTSMEN AND DESIGNERS with structural or building architectural experience for ship work. Salary, $4,200 a year plus overtime. Location, northern New Jersey. W-1561.

CONSTRUCTION ENGINEERS, SUPERINTENDENTS, ASSISTANT SUPERINTENDENTS, AND FIELD ENGINEERS for several highway bridges. Must be able to speak Spanish and handle native labor. Temporary. Must report single status. Salary, $4,200–$6,000 a year. Location, Central America. W-1564.

RODMAN interested in railroad work. Permanent. Salary, $1,920–$2,160 a year. Location, New Jersey. W-1568.

RECENT BOOKS

New books of interest to Civil Engineers donated by the publishers and filed in the Engineering Societies Library, or in the Society's Reading Room, will be found listed here. The notes regarding the books are taken from the books themselves and are edited by members of the staff of the Society or of the Library. Those books which are in the Library may be borrowed by mail by Society members for a small handling charge.

CAN OUR CITIES SURVIVE? An ABC of urban problems, their analysis, their solutions, the proposals formulated by the C.I.A.M. (Congrès Internationaux d'Architecture Moderne, International Congresses for Modern Architecture). By J. L. Sert. Harvard University Press, Cambridge, Mass.; Humphrey Milford, Oxford University Press, London, 1942. 259 pp., illus., diagrs., charts, maps, tables, 12 × 9½ in., cloth, $5.

This important new book on city planning is based upon many years of study and an analysis of thirty-three American and European cities of varied types. The problems of a modern city are approached from both a realistic and a human point of view. The four elementary functions—dwelling, recreation, work, and transportation—are examined with reference to the cultural, social, and political needs of large groups, and safeguards against repetition of past errors. Diagrams and illustrations are strikingly used to present the subject.

INTRODUCTION TO ENGINEERING ECONOMY. By B. M. Woods and E. P. De Garmo. The Macmillan Co., New York, 1942. 441 pp., illus., diagrs., charts, tables, maps, 9½ × 6 in., cloth, $4.

This textbook for engineering students is intended as an introduction to the subject of engineering economy. The relation of such subjects as economics, accounting, statistical methods, etc., to the economy of engineering enterprises is interestingly set forth.

MERRIMAN'S STRENGTH OF MATERIALS, 8 ed. Revised by E. K. Hankin. John Wiley & Sons, New York; Chapman & Hall, London, 1942. 148 pp., illus., diagrs., charts, tables, 9 × 5½ in., cloth, $1.50.

The new edition of this well-known textbook has undergone a thorough revision and rewriting. The reviser has designed it as a basic textbook for non-technical students and mechanics, and has made it more practical than before.

MODERN BUILDING INSPECTION, "The Building Inspector's Handbook." Text by C. N. Dirlam and others; compiled, edited, and arranged by R. C. Colling; sponsored by the Pacific Coast Building Officials Conference, Los Angeles, Calif. Published by R. C. Colling and Associates, 124 West 4th St., Los Angeles, Calif., 1942. 404 pp., illus., diagrs., charts, tables, blueprints, 9½ × 6 in., cloth, $5.

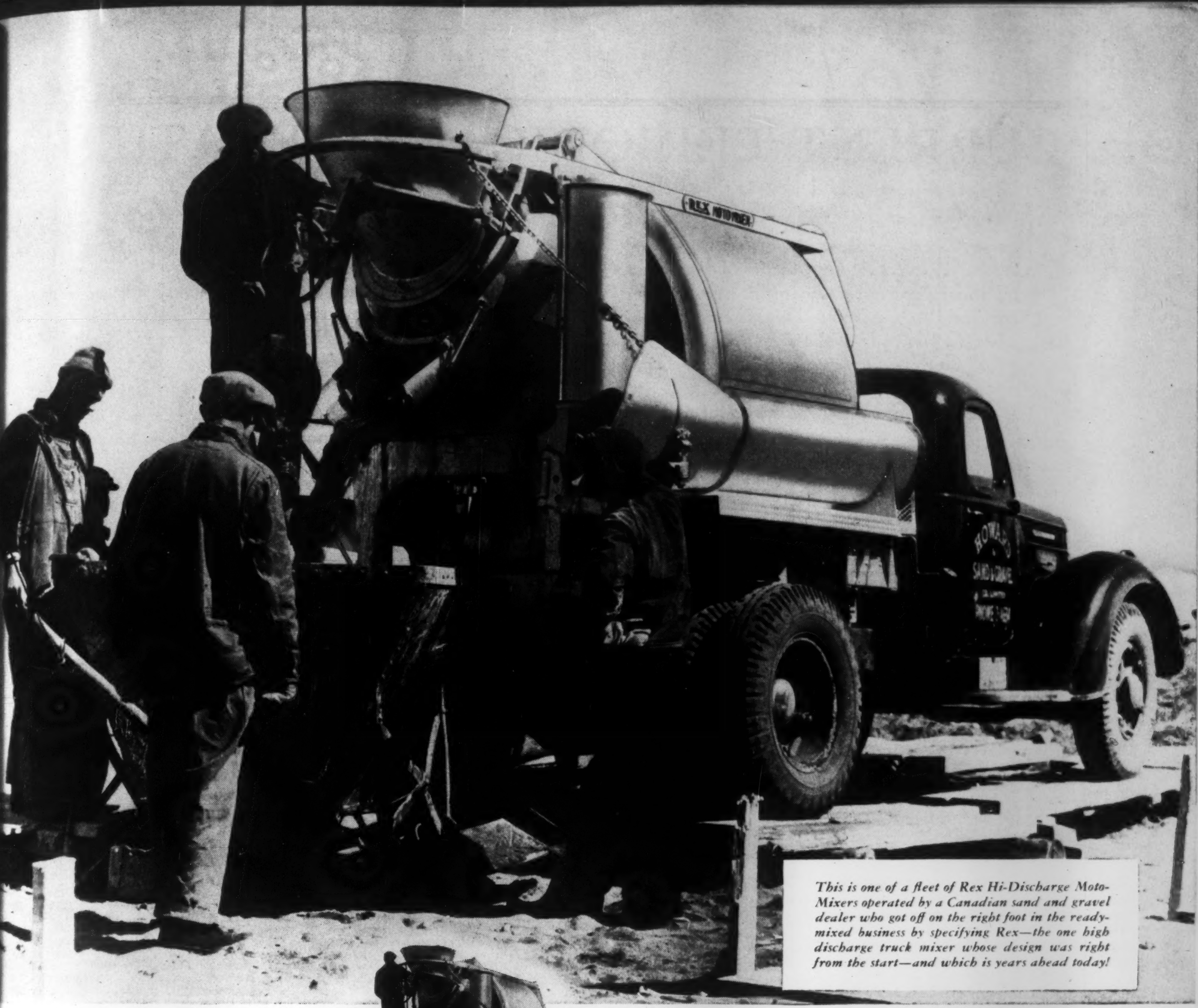
This is an admirable handbook on the organization and administration of building inspection and on the technical problems that arise in the work. The first section describes the organization and work of an inspection department, the drafting of codes, the forms, fees, reports, etc. The second section consists of a concise course in structural engineering for the inspector, and includes a chapter on resistance to wind and earthquake forces. The final section deals with legal problems in connection with the enforcement of building codes. Appendixes contain suggested forms of ordinances and procedures, an extensive bibliography, and a directory of publications and technical associations.

READING ENGINEERING DRAWINGS. By G. F. Bush. John Wiley & Sons, New York; Chapman & Hall, London, 1942. 60 pp., illus., diagrs., charts, blueprints, 11½ × 9 in., linen, $2.

This book has for its object the teaching of the reading of engineering drawings and of their reproductions in a clear, brief, and systematic manner. Only those basic ideas common to all branches of the subject are introduced, and the important branches of airplane drawing, machine drawing and structural drawing are treated in detail. Actual working drawings are provided as examples.

STRUCTURAL DEFENCE AGAINST BOMBING. Engineering Institute of Canada, Montreal (2050 Mansfield Street), Canada. Oct. 1942. 56 pp., illus., diagrs., charts, tables, 11 × 8½ in., paper, $1.

This booklet, prepared by a committee of the Engineering Institute of Canada, presents an excellent outline of methods of protection that will give citizens sufficient protection against aerial attack and will prevent undue dislocation of industrial plants and public services. The methods are based upon British experience and practices. Air-raid shelters, bomb-resisting structures, shelter ventilation, the protection of glass, structural protection against fire, the protection of industry and vital plants, and building design in relation to air attack are considered. There is a bibliography.



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BRIDGES

Concrete Girder, Great Britain. New Waterloo Bridge. *Roads & Road Construction*, vol. 20, no. 237, Sept. 1, 1942, pp. 210–211. Illustrated description of new bridge approaching completion across Thames in London. Similar description previously indexed from *Engineer*, July 17, 1942.

Concrete Girder, Great Britain. Waterloo Bridge. *Engineer*, vol. 174, no. 4514, July 17, 1942, pp. 55–57; see also *Engineering*, vol. 154, nos. 3996 and 3997, Aug. 14, 1942, pp. 131–132, and Aug. 21, p. 150. Illustrated description of new bridge approaching completion across Thames in London; bridge, which replaces Rennie's structure, is much wider than its forerunner, and is carried by fewer piers; it is 80 ft wide and is made up of 5 spans; superstructure consists of "box" girders on each side carrying deck slab 33 ft wide.

Design. Moments in I-Beam Bridges, N. M. Newmark and C. P. Siess. *Ill. Univ. Eng. Experiment Station—Bul. Series No. 336*, vol. 39, no. 44, June 23, 1942, 148 pp. Investigation of action of I-beam bridges; data are based on analytical considerations, and apply to simple-span right bridges consisting of slabs supported by five identical parallel beams, uniformly spaced; moments are determined at various points in slabs and in beams for different positions of concentrated load on structure; general relations bearing on design of I-beam bridges are derived from results of analyses.

Floors. Light Bridge Flooring, S. McConnel. *Civ. Eng.* (London), vol. 37, no. 434, Aug. 1942, pp. 160–162. Light types of deck recently brought into use are: Battledeck flooring; T-Tri-Lok or T-weld floor; I-beam weld floor; truss armor floor; T-weld sidewalk floor; open bridge grid floors; design principles of each dealt with.

Highway, Maintenance and Repair. Emergency Bridge Superstructures. T. W. Childs. *American Highways*, vol. 21, no. 2, Oct. 1942, pp. 9–10. Report of maintenance work being carried out in New Hampshire, using non-critical materials for bridge repairs; construction of wooden superstructures of spans varying from 20 to 60 ft.

Natural Gas Pipe Lines, River Crossings. Short Gas Line Uses Unique Suspension Method, E. Chesnutt. *Oil & Gas. J.*, vol. 41, no. 25, Oct. 29, 1942, p. 49. Brief illustrated description of part of 4-mile line built by Arkansas Power & Light Co.'s gas department to serve plant near Batesville, Ark.; on about three-fourths of route, deep ravines and hard flint rock were encountered; because of depth and steep pitch of side walls of two of ravines, it was necessary to suspend pipe line on wire cable.

Piers, Welded Reinforcement. Welding of 2-Inch Square Reinforcing Bars for Piers of Pit River Bridge, R. Sailer. *Am. Concrete Inst.—J.*, vol. 14, no. 1, Sept. 1942, pp. 53–58. Results of test, prior to construction, showed that satisfactory welds could be obtained if low-carbon steel was used and if certain precautions were taken in welding operations; specifications for steel and necessary precautions are discussed; tests of welds during construction confirmed results of laboratory tests.

Railroad. New Haven Renews 15 Bridges on "Mass-Production" Basis. *Ry. Age*, vol. 113, no. 16, Oct. 17, 1942, pp. 600–663. How through-girder spans, installed on 4-track line of New York, New Haven and Hartford Railroad between New York and New Haven, Conn., were assembled in advance as complete single-track units in connection with improvement program; bridges over highways that were renewed were through plate-girder open-deck spans on sandstone masonry abutments, built in early 1890's; bridges involved in renewal program are located in 12 miles of line between Bridgeport and South Norwalk, Conn.

Railroad, California. False Bents Formed of Suspended Span During Erection of Pit River Bridge, S. S. Leonard. *Western Construction News*, vol. 17, no. 9, Sept. 1942, pp. 398–407. Structural steel members from cantilever section set on concrete foundations for use as falsework during early stages of construction of combination highway and railroad bridge forming part of relocations made necessary by filling Shasta Reservoir of Central Valley Project.

Suspension. Experimental Verification of Theory for Suspension Bridge Analysis, C. B. McCullough, G. S. Paxson, and R. Rosencrans. *Oregon State Highway Commission—Tech. Bul. No. 15*, Sept. 1942, 131 pp., supp. plates. Bulletin deals with design and construction of two models and consists of report of tests made upon these models to measure: Tension in cable; deflections in main spans; grade changes in main spans at towers; bending moments in main span stiffening frames.

Switzerland. Brueckenbauten in der Schweiz. *Zement*, vol. 30, no. 21, May 22, 1942, pp. 277–279. Bridge construction in Switzerland; illustrated description of some outstanding bridges of recent construction.

Wrecking. Demolition of Overbridge on Great Western Railway. *Ry. Gaz.*, vol. 77, no. 7, Oct. 23, 1942, p. 393. Removal of three-span arched structure by use of explosive; details of manner in which work was carried out. From *Great Western Ry. Mag.*, date not specified.

BUILDINGS

Air-Raid Precautions, Shelters. Structural Defense Against Bombing. *Eng. Inst. Canada*, Montreal, Oct. 1942, 55 pp. Outline of methods of protection against aerial attack; bombing and its effects; types of air-raid shelters discussed; bomb-resisting structures; shelter ventilation; protection of glass; protection against fire; building design in relation to air attack. Bibliography.

Building Materials, Substitutes. Forget Tradition—or Don't Try to Build! E. L. Cady. *Mill & Factory*, vol. 31, no. 4, Oct. 1942, pp. 86–87 and 152–154. How fewer critical materials can be used if traditional building specifications can be forgotten; present situation with reference to metals, wood, concrete, glass, and other materials.

Concrete. Auditorium Building Redesigned in Concrete, W. H. Wheeler. *Eng. News-Rec.*, vol. 129, no. 17, Oct. 22, 1942, pp. 578–579. After foundations were complete, steel for columns, girders, 100-ft span roof trusses, and balcony framing of original design was not available, so redesign was made in concrete; T-beams of 100-ft span were substituted for trusses, and bar joists for steel purlins; one steel girder was replaced by concrete girder 10 ft deep and 18 in. wide.

Design. Planning World's Largest Building. *Eng. News-Rec.*, vol. 129, no. 17, Oct. 22, 1942, pp. 569–575. United States War Dept. is now completing office building that has 4,000,000 sq ft of floor space; five-sided, or pentagonal, in shape, reinforced-concrete structure is five stories high, and in some areas has both basement and sub-basement; each of five exterior sides is 921.6 ft long, while sides around inner court are 360.8 ft long.

Frost Effect. Effects of Frost on Bearing Parts of Buildings, H. Spiegel. *Civ. Eng.* (London), vol. 37, no. 433, July 1942, p. 154. During severe winter of 1939–1940 in Germany, damage to walls and floors of partly erected or newly completed buildings due to frost action was of frequent occurrence; owing to cellars not being heated, foundation soil froze and heaving took place; it is concluded that in case of partially constructed and newly completed unoccupied buildings, absence of warm cellar is important factor. English abstract from *Bauwelt*, vol. 32, 1941, pp. 70–73.

Structures, Bombing Effect. Effect of Aerial Warfare on Steel-Framed Buildings, V. G. Iden. *Steel*, vol. 111, no. 12, Sept. 21, 1942, pp. 66–68 and 104–105. American type of skyscraper is very safe; in England, fully steel-framed building has suffered only to minor extent and has shown remarkable resilience, which has tended to localize damage; air raid shelters in New York decided against because modern steel-framed buildings are considered as safe place as any in case of air raid; photographs of typical bomb damage to British steel framed buildings presented. Before Building Officials Conference of America, Inc.

Vibrations. Vibrations of Buildings, D. Young. *Texas Univ.—J. Architecture Eng. & Industry*, vol. 5, no. 1, Sept. 1942, pp. 13–18. Discussion of tests conducted and practical designs evolved for buildings to resist earthquake shocks; vibrations as indication of structural strength; shock due to aerial bombs; building requirements to resist direct hits; blast-wave pressures.

Warehouses, Steel-Frame. Built on Schedule and Below Estimate. *Eng. News-Rec.*, vol. 129, no. 15, Oct. 8, 1942, pp. 482–483. Cincinnati District U.S. Engineers, recently completed on schedule 180 by 720-ft steel frame warehouse, which provides 129,000 sq ft of floor space, at cost $8^1/_2\%$ below original estimate; structural features and details of construction work described.

CITY AND REGIONAL PLANNING

Cities and Towns, Restoration. Cronistoria del Risanamento di Sassello in Lugano. *Rivista Tecnica della Svizzera Italiana*, vol. 29, nos. 3, 4–5, and 7, Mar. 1942, pp. 39–43; Apr.-May, pp. 59–61; and July, pp. 95–99. Account of restoration of Sassello quarter in Lugano, Switzerland; demolition of old buildings; ground plan of reconstructed area; views of building and section before and during demolition.

Planning Coordination. Coordination in Town and Country Planning, J. W. Turner. *Surveyor*, vol. 101, no. 2636, July 31, 1942, pp. 263–264. Outline of proposed organization and authority for National Plan; local administration of National Plan; civic design discussed.

Post-War. Great Britain Organizes for Post-War Building. *Indus. Standardization*, vol. 13, no. 9, Oct. 1942, pp. 243 and 246. Comprehensive program of research and development in entire building field is under way as first part of program for post-war rebuilding of British cities and towns; brief note on building program.

Post-War. Land Utilization in England and Wales. *Nature* (London), vol. 150, no. 3807, Oct. 17, 1942, pp. 448–450; see also editorial comment, pp. 441–443. Review of report submitted by Scott Committee on Land Utilization in Rural Areas; review of present position, land, and population, impact of town on countryside, war and probable post-war trends; outline of five-year plan for England and Wales.

Post-War. Post-War Planning and Reconstruction, H. J. B. Manzoni. *Instn. Mun. & County Engrs.—J.*, vol. 69, no. 1, July 21, 1942, pp. 20–37. Principal items, concerning which decisions are required as basis for organization for reconstruction can proceed, are given; national skeleton plan; detail planning units; regional collaboration; reconstruction and new construction.

CONCRETE

Airport Runways. Big Airbase Paved in Ninety Days. *Eng. News-Rec.*, vol. 129, no. 15, Oct. 8, 1942, pp. 479–481. In building 3,000-acre airbase only 90 days were allowed for construction of 604,000 sq yd of concrete and 330,000 sq yd of asphaltic pavement required for apron, runways, and taxi strips; general procedure in complete construction is described.

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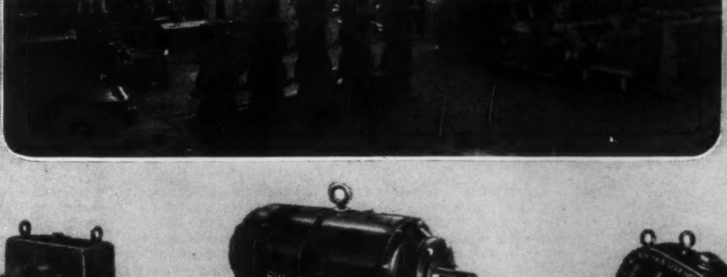

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Airport Runways. How Army Cut Cost of Concrete Runways on Airfield in Inland Empire, W. A. Averill. *Pacific Bldr. & Engr.*, vol. 48, no. 10, Oct. 1942, pp. 30–32. Details of design features which constitute major departures from standards heretofore enforced; cement content is cut one-third; cross-section is reduced in thickness; dummy joints are submerged; transverse joints are spaced at 180 ft.

Air-Raid Precautions, Shelters. Air-Raid Shelters for Factory Yards. *Eng. News-Rec.*, vol. 129, no. 13, Sept. 24, 1942, pp. 430–431. Navy Yard practice suggests use of small shelters, set on top of ground, close to working areas; any improvised enclosure that will protect against blast, fragmentation, and machine-gun fire is satisfactory; most advanced design at present uses walls of concrete block and concrete slab and concrete slab for floor and roof, all three elements tied together with continuous reinforcing.

Cement Plants, Iowa. All-Concrete Cement Factory. *Concrete & Constr. Eng.*, vol. 37, no. 9, Sept. 1942, pp. 336–339. Features of new cement factory being built by Marquette Cement Manufacturing Company at Des Moines, Iowa. See *Engineering Index*, 1941, p. 200.

Concrete Aggregates, Africa. American Engineer Tells Problems of Producing Aggregates in African Bush, F. H. Edwards, Jr. *Pit & Quarry*, vol. 35, no. 4, Oct. 1942, pp. 51–54. General descriptive account, dealing with problems arising in production of rock for 30,000 cu yd of concrete for hydroelectric plant 2 miles from rubber plantation at Harbel, Liberia; overflow-type dam, about 1,000 ft long, directs flow of stream to channel leading to earth canal, from which separate penstocks will serve two turbine units driving 750-kw generators; details of aggregate plant.

Construction, Forms. Taking Full Advantage of Sliding Forms Gains Speed and Economy, S. W. Galloway. *Concrete*, vol. 50, no. 9, Sept. 1942, pp. 2–3. "Sliding form" method explained by describing its application in construction of reinforced concrete coal bin of 1,600-ton capacity; method permits erection of concrete buildings with only small percentage of lumber which would be required for such forms; it saves labor on such forms, and finally it allows concrete wall to be built in continuous concreting operation.

Design. Concerning Shear in Concrete Sections, W. S. Wilson. *Surveyor*, vol. 101, nos. 2642 and 2643, Sept. 11, 1942, p. 315, and Sept. 18, pp. 319–320. Formula presented for finding unit shear at any section, when total load supported by any concrete member of given dimensions and span is known; examples illustrate how intensity of unit shear affects design of typical concrete members.

Drydocks, Construction. Twin Drydocks Constructed Under Water. *Eng. News-Rec.*, vol. 129, no. 21, Nov. 19, 1942, pp. 702–709. Twin drydocks being built at eastern navy yard; H-bearing piles are driven so their tops are many feet below surface; huge sections of forms are set on harbor bottom and more than half million yards of concrete is being placed by tremie in 5½ months; concrete is mixed by double-drum pavers and pumped to scows equipped with sliding tremie pipes for underwater placing.

Girders. Curved Box Girders for Highway Overpass. *Eng. News-Rec.*, vol. 129, no. 21, Nov. 19, 1942, pp. 698–699. In constructing reinforced concrete overpasses at Los Angeles, box girders were built on curves in preference to straight-line design because curved construction cost less and fitted requirements more precisely; each of two bridges has four lines of girders curved on radii ranging down to 200 ft; spans, measured on curve, range up to 70 ft.

Grading Aggregates. Effect of Grinding in Large Mixers on Aggregate Grading at Hiwassee Dam, W. R. Waugh. *Am. Concrete Inst.—J.*, vol. 14, no. 1, Sept. 1942, pp. 9–20. Preliminary investigations revealed that changes in grading due to grinding in mixers would be major consideration in concrete control; details of field investigations; variable grinding during mixing made production of concrete of uniform quality more difficult; several conclusions in regard to grinding are given.

Mixing. Concrete for War Department's Office Building Made by Precision Methods. *Pit & Quarry*, vol. 35, no. 3, Sept. 1942, pp. 99–100. Building is located in Arlington County, Virginia, near end of 14th Street Bridge from Washington, D.C.; dimensional data; about 300,000 cu yd concrete required for building and about 200,000 cu yd for roads, bridges, etc.; last monthly pour exceeded 50,000 cu yd; specification; batching practice.

Mixing. Determining Proportions of Concrete for Desired Compressive Strengths, A. T. Goldbeck and J. E. Gray. *Eng. News-Rec.*, vol. 129, no. 19, Nov. 5, 1942, pp. 638–639. Tables for rapid design of concrete mixes for various compressive strengths are made available; use of tables and general design procedure are outlined in detail by solving sample problem.

Piles. Concrete Jackets Make Up for Unequal Pile Lengths. *Eng. News-Rec.*, vol. 129, no. 17, Oct. 22, 1942, pp. 544–547. Difficult driving was simplified by pre-cast jackets that relieved exact requirements on length and position of reinforced concrete piles in piers designed for loads of 1,000 lb per sq ft; pre-cast concrete jackets also were put around batter piles of untreated timber, after driving.

Products Plants, Utah. Concrete for Big Utah Plant. *Western Construction News*, vol. 17, no. 10, Oct. 1942, pp. 447–449. Portable unit crushes, screens, and washes 6,000 tons of aggregate daily for batching and mixing in dual automatic plant at site of West's largest industrial installation.

Ready Mixed Plants, New York. Pneumatic Pump and Pipe-Line Deliver Cement to Ready-Mix Plants in Bronx. *Pit & Quarry*, vol. 35, no. 4, Oct. 1942, pp. 80–81. Notes on plant at 169th Street and Harlem River, New York City.

Reinforcement. Providing Cover to Reinforcement, L. E. Hunter. *Concrete & Constr. Eng.*, vol. 37, no. 9, Sept. 1942, pp. 318–325. Methods used to maintain adequate cover on reinforcement vary considerably for various types of construction, and means of supporting bars depends on material available and desirability of keeping steel-fixing costs as low as possible; review of methods used in practice.

Ships. New Concrete Vessel Launched. *Naut. Gaz.*, vol. 132, no. 11, Nov. 1942, pp. 33 and 39. Particulars of "Phantom," experimental reinforced concrete vessel, constructed in Tropical Marine Ways Yard, Riviera, Fla.; over-all length 91 ft 6 in., beam 14 ft; depth 7 ft; vessel weighs 78 tons—68 of concrete and 10 of steel, almost reversing ratio of concrete vessels of first World War; propelled by 150-shp Diesel engine; vessel can carry oil cargo of 34,000 gal.

Shrinkage. Volume Changes in Concrete Due to Moisture, R. Allin. *Civ. Eng.* (London), vol. 37, no. 434, Aug. 1942, pp. 165–167. Review of findings of research on volumetric changes, (especially shrinkage), factors controlling them, and practical bearing of this property on plain and reinforced concrete as structural materials.

Slabs, Design. Concerning Rectangular Concrete Sections, W. S. Wilson. *Surveyor*, vol. 101, nos. 2638 and 2640, Aug. 14, 1942, pp. 279–280, and Aug. 28, pp. 297–298. Fundamental formulas for design of thin concrete slabs subjected to bending and application of such formulas in cases that depart from usual working stresses.

Structures, Bombing Effect. Resistance of Reinforced Concrete Structures to Air Attack, J. B. Wells. *Bldg. Standards Monthly*, vol. 11, no. 10, Oct. 1942, pp. 16–18. One of problems presented by modern aerial warfare is effect of bombing on reinforced-concrete structures and methods of design to best resist such attack; most of material published on this subject is result of observations made in England, although some tests have been made by U.S. War Dept.; author attempts summary of most important points presented in publications that have come to his notice recently.

Tanks. Concrete Storage Tanks for Fuel and Diesel Oils, H. M. Hadley. *Pacific Bldr. & Engr.*, vol. 48, no. 9, Sept. 1942, pp. 30–36. Design and construction features of pre-stressed and embedded reinforced types of concrete tanks with discussion of new "wedged" type suggested by author.

Water Tanks and Towers. Elevated Concrete Tanks Conserve Critical Steel. *Western Construction News*, vol. 17, no. 7, July 1942, pp. 303–305. Three reinforced concrete tanks, with capacities of 150,000 to 250,000 gal, are being constructed as alternates to steel design by Federal Works Agency in vicinity of Tacoma, Wash.

CONSTRUCTION INDUSTRY

Post War. Civil Engineers and Building Industry. *Engineer*, vol. 174, no. 4521, Sept. 4, 1942, pp. 186–188, (editorial comment) 194–195. Report on conference of members of Institution of Civil Engineers, to consider question, "What can engineer contribute, now and after war, to development of building and civil engineering industries?" Brief notes on various speeches.

DAMS

Concrete, India. Kalabagh Barrage, S. I. Mahbub. *Civ. Eng.* (London), vol. 37, no. 434, Aug. 1942, pp. 162–164. Design and construction features of dam 3,781 ft long between abutments for Thal canal system project in India. Before Punjab Eng. Congress.

Concrete Gravity, California. Three-Purpose Auxiliary Dam. *Western Construction News*, vol. 17, no. 10, Oct. 1942, pp. 444–446. Keswick Dam, being built on Sacramento River by U.S. Bureau of Reclamation as part of Central Valley project of California, will serve for secondary flood regulation, salmon protection, and supplementary power generation.

Concrete Gravity, California. Methods of Handling and Placing Concrete at Shasta Dam, C. S. Rippon. *Am. Concrete Inst.—J.*, vol. 14, no. 1, Sept. 1942, pp. 1–8. Description of equipment and methods employed by contractor in handling and placing 6,500,000 cu yd of concrete in construction of dam and power plant.

Concrete Gravity, Tennessee Valley Authority. Cherokee Dam. *Engineer*, vol. 174, nos. 4515 and 4516, July 24, 1942, pp. 75–77, and July 31, pp. 84–86. Illustrated description of dam on Holston River, near Knoxville, Tenn.; dam is composed of concrete power house and flanking gravity concrete sections, including spillway section and two non-overflow sections, latter adjoining embankment section on each side of river formed of combination of earth and rock fills. See also *Engineering Index*, 1941, p. 302.

Concrete, Gravity, Washington. Reinforced Concrete Bridge Over Spillway. *Concrete & Constr. Eng.*, vol. 37, no. 9, Sept. 1942, pp. 331–333. Unusual method of supporting falsework of Grand Coulee Dam is described.

Concrete, Raising. Addition to Concrete Dam, H. B. Ward. *Civ. Eng.* (London), vol. 37, no. 433, July 1942, pp. 138–140. Description of raising of mass concrete dam; height was increased 10 ft.

Construction, Materials Handling. Materials Handling for Santa Fe Dam. *Eng. News-Rec.*, vol. 129, no. 13, Sept. 24, 1942, pp. 434–437. Grading and moving 12,000,000 cu yd of fill material going into several zones of Santa Fe Dam on San Gabriel River in Southern California; methods used in handling fill material are given, special attention being devoted to design of grizzlies used in segregating coarse fill materials.

Construction. Preliminary Design Chart—IV. Volume Curves for Concrete Dams, A. E. Niederhoff and F. L. B. Miller. *Western Construction News*, vol. 17, no. 10, Oct. 1942, pp. 452–454. Volume of concrete in dams of either spillway or bulkhead section may be determined for preliminary estimates by considering dam in segments and referring each one to chart.

Design. Fundamentals for Designing Low Dams. *Pub. Works*, vol. 73, nos. 9, 10, and 11; Sept., 1942, pp. 14–16 and 44–47; Oct., pp. 14–16 and 68–70; and Nov. pp. 19–21, 34, 36, and 38–39. By "low dams" is meant those not over 20 ft high; article sets forth general principles and procedures for designing such dams.

Hydraulic Fill, Nebraska. Kingsley Dam. *Engineer*, vol. 174, nos. 4513 and 4514, July 10, 1942, pp. 35–38, and July 17, pp. 46–48. Illustrated description of project of Central Nebraska Public Power and Irrigation District; dam is second largest earth fill structure built in United States by present-day hydraulic methods, and its construction has required approximately 27,000,000 cu ft of fill; two control features are respectively designated "outlet tower" and "Morning Glory spillway."

Reservoirs, Concrete. Constructing La Grande Reservoir, E. H. Ford. *Pub. Works*, vol. 73, no. 10, Oct. 1942, pp. 19–20. Constructional details of reinforced concrete reservoir, with capacity of 2½ million gal, at La Grande, Ore., which is 250 ft in diameter; circular wall floats on circumference of dished bottom that contains no expansion joints.

Steel Structures, Protective Coatings. Protective Coatings for Steel, C. H. Ellaby. *Engineer*, vol. 174, no. 4517, Aug. 7, 1942, p. 122. Study of protective coatings for steel surfaces subjected to both water and atmospheric exposure, for purpose of providing effective and economical coating for steel control gates on 33 dams and locks on Upper Mississippi River and Illinois River. From paper read at Chicago Museum of Science & Industry.

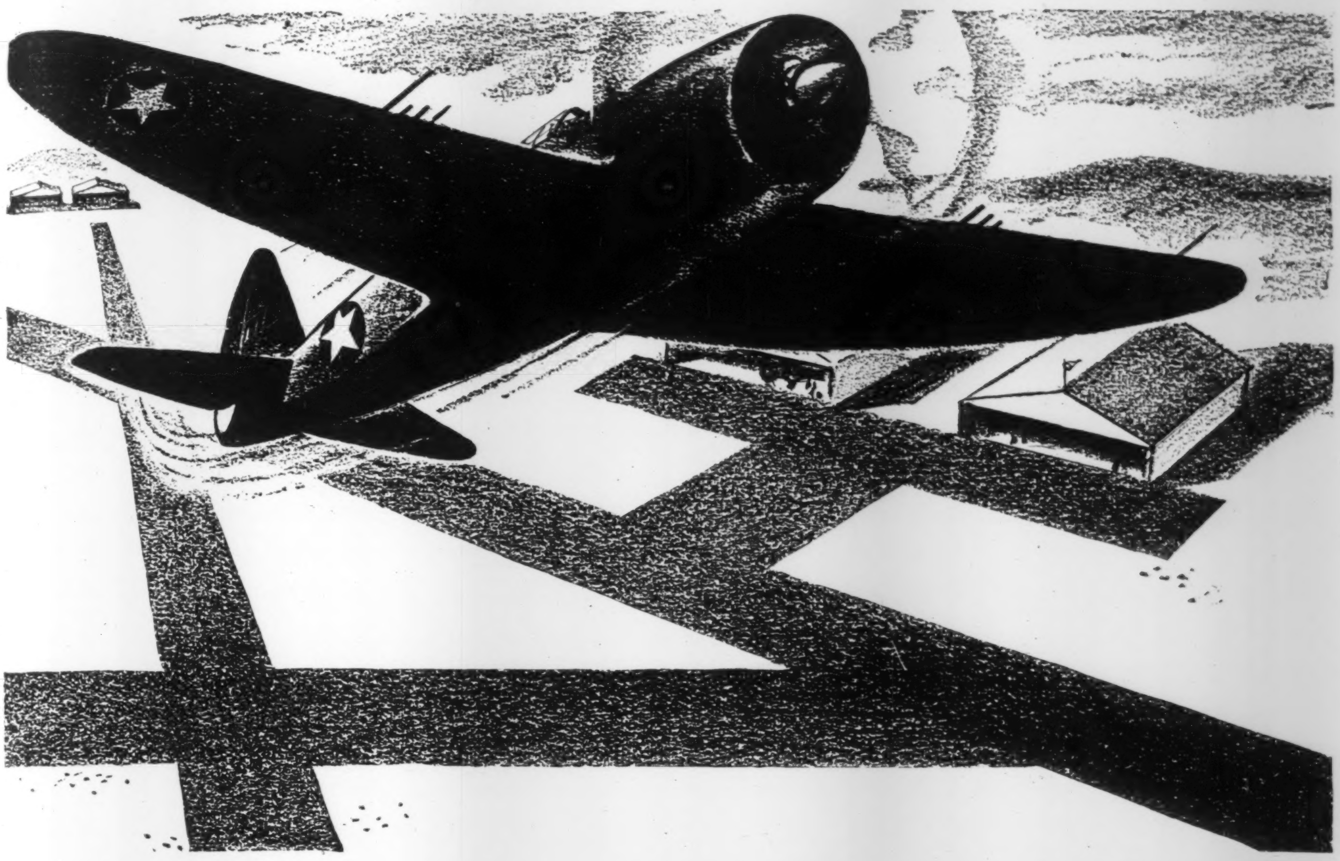
FOUNDATIONS

Air-Raid Shelters. Combined Air-raid Shelters and Raft Foundation, A. L. L. Baker. *Concrete & Constr. Eng.*, vol. 37, no. 9, Sept. 1942, pp. 326–330. There are several very large areas in vicinity of docks where sites have been cleared and where, in future, high buildings will be constructed; description of method of combining air raid shelters for present use with raft foundations for buildings to be erected after war.

Concrete Piles, Driving. Drives 65-Ft Concrete Piles Weighing 14½ Tons. *Ry. Age*, vol. 113, no. 11, Sept. 12, 1942, pp. 409–411. Method used by Norfolk & Western Railroad to construct pre-cast reinforced concrete piles, in connection with bridge renewal job on its double-track main line, is described.

Earthwork. Earthwork Tables, A. S. Lindsay. *Soc. Engrs.—J. & Trans.*, vol. 33, no. 1, Jan.–June 1942, pp. 5–8. Tables compiled in order to simplify operation of taking out quantities of materials in cuttings or embankments, and thereby reduce time normally occupied in computing such quantities.

Excavation. Solving Quantities in Excavation and Fill, B. F. Powell. *Eng. News-Rec.*, vol. 129, no. 17, Oct. 22, 1942, pp. 558–559. During design of zoned earth and rockfill dams it is usually necessary to make several solutions involving assumed ratios of separation of material with which structure is to be built; chart



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showing graphically amount of excavation and fill produced in two specific cases involving solid rock borrow and cobble and earth borrow, is given.

Machinery Foundations, Vibrations. Grouting Checks Foundation Vibration. *Eng. News-Rec.*, vol. 129, no. 17, Oct. 22, 1942, pp. 561–562. Vibrations set up by compressors of gas station in Wichita, Kans., caused serious trouble in pile foundations of both machines and building in which they were housed; vibrations were practically stopped by grouting 50 ft of sand, through which piles were driven; application of grout under pressure was through solid wall pipes, perforated after driving, by ingenious gun that shot bullets through pipe at desired locations.

Piles, Wooden. Wood Piles with Mortar Coating Save Time and Critical Materials. *Eng. News-Rec.*, vol. 129, no. 19, Nov. 5, 1942, pp. 624–626. Technique for putting sand cement protective coating around long, untreated wood piling for rush pier job; resultant structure has such strength, rigidity, and durability that more widespread use of protective method began immediately, and 45-ft portions of 100 to 125-ft piles on other jobs are now being protected in this way.

Piles, Wooden, Removal. Under Water Cutting, by Explosive Methods, of Timber Piles at Bridge over Maribyrnong River, W. G. Wright. *Instn. Engrs. Australia—J.*, vol. 14, no. 3, Mar. 1942, pp. 72–73. Piles were double cleated at 15 ft below silt level; since stream is navigable waterway, it was necessary to demolish piles cleanly at silt level, average length of pile to be removed being 16 ft; girdle method for explosive work was, therefore, adopted; arrangement of placing explosive charge shown in drawing.

Problems, Airport Runways. Airport Foundation Problems. *Western Construction News*, vol. 17, no. 9, Sept. 1942, pp. 395–397. Corps of Engineers building major air base in Pacific Northwest finds difficult foundation problems in spring-fed lakes with blue-day beds; construction of earth-fill foundations carefully controlled to provide building support.

Soils, Mechanics. Some Structural Applications of Soil Mechanics, M. P. Beausang. *Civ. Eng.* (London), vol. 37, no. 434, Aug. 1942, pp. 169–172. Soil mechanics helps to understand and predict behavior of various soil types, to diagnose and prescribe for those weak in bearing, and to prescribe best method for compacting material used in fills and embankments to its best density; procedure for design of sub-soils for roadwork is given. Before Inst. Civ. Engrs., Ireland.

Soils, Stabilization. Removing Mud Pockets from Filled Ground. *Eng. News-Rec.*, vol. 129, no. 13, Sept. 24, 1942, p. 423. Problem of very large mud pockets in dredged fill was solved by simple, effective means, using bulldozers, draglines, and dump trucks; procedure was to excavate material from center of pocket as dry material was added and compacted around edges.

HYDRAULIC ENGINEERING

Silt, Transportation. Investigation of Stability of Bed Materials in Stream of Water, J. Allen. *Instn. Civ. Engrs.—J.*, vol. 18, no. 5, Mar. 1942, pp. 1–34, supp. plate. Stability of wall or mound of cubical blocks is discussed; it is shown that while isolated bolster is less stable than isolated cubical block of same weight, yet difference in case of random mound is far less marked; emphasis is laid upon effect of degree of flexibility of such bolsters and upon their property of interlocking; tests on flat beds and on mounds of various aggregates.

HYDROELECTRIC POWER PLANTS

Excavation. Earthmoving Contract for Decew Falls Power Station Major Engineering Feat. *Eng. & Contract, Rec.*, vol. 55, no. 44, Nov. 4, 1942, pp. 8–10. One of Canada's biggest earthmoving jobs is being carried out at Decew Falls, Ont., by Ontario Hydroelectric Power Commission; when work at present under way is complete more than 1,500,000 cu yd of earth and 250,000 cu yd of rock will have been excavated and moved; manner in which work is being carried out.

HYDROLOGY AND METEOROLOGY

Bank Protection. Suggestions for Treatment of Road Banks. *Roads & Bridges*, vol. 80, no. 10, Oct. 1942, p. 80. Two revised charts that should be regarded as supplanting those used by C. R. Hursh, in article, "Naturalization of Road Banks as Integral Part of Highway Construction," previously indexed from issue of July 1942; these charts give suggestions for stabilization of both moist banks having deep, rich soils and relatively dry banks having sterile soils not favorable to vegetation.

Meteorology, Coast Artillery. Meteorology for Coast Artillery. *U.S. War Dept.—Tech. Manual No. 4-240*, Dec. 20, 1941, 92 pp. Instructions and technical meteorological knowledge needed by personnel serving at coast artillery meteorological stations; these stations are operated for purpose of supplying meteorological data to coast artillery batteries.

Weather Forecasting. Can Meteorological Service Help to Improve Winter Road Maintenance? J. Patterson. *Roads & Bridges*, vol. 80, no. 10, Oct. 1942, pp. 39–40, 92, and 94. Usefulness of weather forecasts; value to road men; precision in forecasts; how aviation has helped; radio robots.

INLAND WATERWAYS

Rivers, Mississippi. Hydraulic Model Study of Lower Mississippi. *Military Engr.*, vol. 34, no. 203, Sept. 1942, pp. 446–451. Report of model investigation carried out by Corps of Engineers at U.S. Waterways Experiment Station, Vicksburg; general description of model; essential characteristics; scale values; method of operation; application of model results to prototype problems.

IRRIGATION

Rubber Plantations. Production of Guayule Rubber Under Irrigation, G. E. P. Smith. *Agric. Eng.*, vol. 23, no. 10, Oct. 1942, pp. 312 and 324. Domestication of guayule, wild shrub used as source of rubber in Mexico, was begun in 1911 near San Diego, Calif.; description of projects, one near Tucson, Ariz., and later undertaking in Salinas Valley, Calif. Federal Government took over latter project in March 1942. Before Am. Soc. Agric. Engrs.

Water Supply. Irrigation Water Supply System Capacities, C. V. Givan. *Agric. Eng.*, vol. 23 no. 9, Sept. 1942, pp. 281–283. Graphical method of accounting for changes in soil moisture regimen is explained by referring to diagram used to study irrigation of mature prune orchard which is growing where soil and climate are similar to those of Davis, Calif.

LAND RECLAMATION AND DRAINAGE

Culverts. Highway Culvert Location and Slope From Review of California Practice, R. R. Rowe and G. A. Tilton, Jr. *Calif. Highways & Pub. Works*, vol. 20, no. 11, Nov. 1942, pp. 4–9. Discussion of culvert location with respect to natural channel; typical locations are named, defined, and compared, with recommendations; obviously horizontal and vertical locations are not independent, but two subjects are developed separately for easier reference; vertical location involves consideration of slope, for which new guides are presented. Bibliography.

Culverts, Box. Design of Box Culverts, C. R. Burky. *Am. Concrete Inst.—J.*, vol. 14, no. 1, Sept. 1942, pp. 33–52. Box culverts are usually built to carry drainage water under canals, to carry drainage water under roads or railroads, or to carry canal water under roads, railroads, other canals, or natural drainage channels; some of methods used in design of box culverts are given; much of procedure outlined would apply to any box structure.

MATERIALS TESTING

Beams, Wooden. Stress-Strain Relations in Timber Beams (Douglas Fir), A. G. H. Dietz. *Am. Soc. Testing Matls.—Bul.*, no. 118, Oct. 1942, pp. 19–27. Research made to determine reasons for differences in behavior of wood, in bending and direct stress; two theories, Bach-Baumann and Newlin-Trayer, are investigated; five beams of edge grained Douglas Fir, three at 9% moisture content and two at 24%, were tested, as were direct tension and direct compression specimens cut from beams; measurements made by electrical resistance wire gages cemented to sides of test specimens; results.

Concrete. Long-Period Tests on Cement and Concrete. *Concrete & Constr. Eng.*, vol. 37, no. 10, Oct. 1942, pp. 385–387. Notes on very extensive series of tests just started with view to studying effect on concrete of differences in portland cements; work is being undertaken by American Portland Cement Assn.

Concrete Aggregates. Developments in Methods of Testing and Specifying Coarse Aggregates, L. H. Tuthill. *Am. Concrete Inst.—J.* vol. 14, no. 1, Sept. 1942, pp. 21–32. In suggesting different basis for testing screening of coarse aggregate, emphasis is placed on that portion of undersize material which is most detrimental to production of uniform, high-quality concrete; characteristics of undersize and common practice in screening and handling of aggregates are discussed; text for determination of only "significant" (objectionable) portion of nominal undersize is submitted.

Concrete Aggregates. Effect of Size of Specimen in Studies of Durability of Concrete as Affected by Aggregates, S. Walker and F. F. Bartel. *Am. Soc. Testing Matls.—Bul.*, no. 118, Oct. 1942, pp. 37–39. Exploratory tests on effect of concrete test specimens in studies of coarse aggregates, presented.

PORTS AND MARITIME STRUCTURES

Emden, Germany. Air Force Targets. *Engineer*, vol. 174, no. 4516, July 31, 1942, pp. 89–91. Illustrated description and map of inland port of Emden; its shipbuilding and shipping facilities; details of harbor works.

Pile Driving. Pile Driving Without Pile Frame, S. Pearson. *Instn. Civ. Engrs.—J.*, vol. 18, no. 5, Mar. 1942, pp. 93–97. Operation to be carried out consisted of driving of 6-in. by 6-in. timber piles ranging, according to ground conditions, from 18 ft. to 26 ft. in length, to form main support for new revetment of badly eroded river bank; description of methods and equipment used in completing job.

Port Structures, Wood Preservation. Marine Borers, Secret Destroyers of Sea, T. H. Hansen. *World Petroleum*, vol. 13, no. 7, July 1942, p. 40–43. Three main groups of marine borers are discussed; creosote acts as poison, discouraging borer attacks as long as wood is impregnated; problem is more acute in tropics, as borer is active throughout year and because creosote is leached out more rapidly in warm water; advantages of "Toxic Refill," described by same author in paper indexed in *Engineering Index*, 1941, p. 921.

RAILROADS, STATIONS, AND TERMINALS

Railroad Structures, Maintenance and Repair. C.N.R. Uses New Method of Repairing Concrete and Masonry Structures, E. J. Napier. *Roads & Bridges*, vol. 80, no. 9, Sept. 1942, pp. 25–27 and 94–95. Details of intrusion and prepak method of repairing concrete and masonry structures of Canadian National Railways.

ROADS AND STREETS

Access-Roads. How Missouri Builds Access Roads. *Eng. News-Rec.*, vol. 129, no. 13, Sept. 24, 1942, pp. 412–414. In order to provide better roads, in vicinity of Fort Leonard Wood, 12 miles of U.S. 66 are being improved from winding route with single traffic lane each way to four-lane divided highway; maximum grades are restricted to 5.7%, horizontal curves are limited to 2°, and sight distances to 1,000 ft horizontally and 800 ft vertically.

Airport Runways. Airports for Hundred-Ton Bombers, W. R. Macatee. *Roads & Bridges*, vol. 80, no. 7, July 1942, pp. 16–18 and 129–131. Scientific design for pavements on military flying fields; suggested method for field evaluation of subgrade support.

Airport Runways, Soil-Cement. Building Airport Runways of Native Soil and Portland Cement, G. G. O'Fiel. *Roads & Streets*, vol. 85, no. 9, Sept. 1942, pp. 29–34. Description of construction work on Texas airport project where soil cement runways and taxiways conserved critical materials; character of soil, proportions of mix, and total quantities; subgrade construction.

Airport Runways, Soil Cement. Deer Park Airport—Soil-Cement Project, J. W. Johnson. *Pacific Bldr. & Engr.*, vol. 48, no. 11, Nov. 1942, pp. 36–40. Details pertaining to processing of soil cement base at Deer Park Airport; nature and characteristics of soil cement; why soil cement was chosen; testing; construction methods; entire project consists of 180,717 sq yd and will be covered with wearing course of $1^1/_2$-in. bituminous plant mix followed by single seal coat.

Airport Runways, Soil Cement. Soil-Cement Use on Airports, L. W. Miller. *Western Construction News*, vol. 17, no. 7, July 1942, pp. 310–311. Runways, taxiways, parking aprons, and dispersal revetments are constructed of low-cost soil-cement as means of reducing fragmentation effect of high explosive detonations that might occur in case of enemy attack on airports.

Airports, Snow Removal. Fighting Snow to Keep 'Em Flying, H. W. Hunt. *Eng. News-Rec.*, vol. 129, no. 19, Nov. 5, 1942, pp. 641–652. Best practice to keep fields open is to get snow off and keep it off runways at all times; plows, windrowing snow, followed by rotary blowers to spread it without establishing banks, are generally preferred method of handling snow on airports; clearing with plows alone can be made effective; preparation of snow surfaces for skis and wheels is described.

Airports, Snow Removal. How Canadian Airports Solve Problems of Snow Control. *Eng. & Contract, Rec.*, vol. 55, no. 42, Oct. 21, 1942, pp. 22–23, 42, and 44. Two methods found satisfactory are compaction and bodily removal of snow; problem of sudden break-ups in compaction; chart showing successive steps in compaction of snow on hard-surfaced runways given.

Construction. Changes in Pavement Specifications Are Necessary for Duration, H. F. Clemmer. *Concrete*, vol. 50, no. 9, Sept. 1942 pp. 33–34. Way in which certain design and construction changes may be made in order to carry on necessary high-type construction within limitations imposed through scarcity of certain critical materials. Before Am. Road Bldrs. Assn.

Expressways and Parkways, New York City. Design and Construction of Queens Midtown Elevated Highway, F. Lilien. *Mun. Engrs. J.*, vol. 28 (First Quarterly issue), 1942, pp. 16–33, (discussion) 33–44. Midtown highway is link in arterial highways system in New York City; it connects New Jersey, through Lincoln Tunnel and Midtown Tunnel, with parkway systems of Long Island; history; general design;

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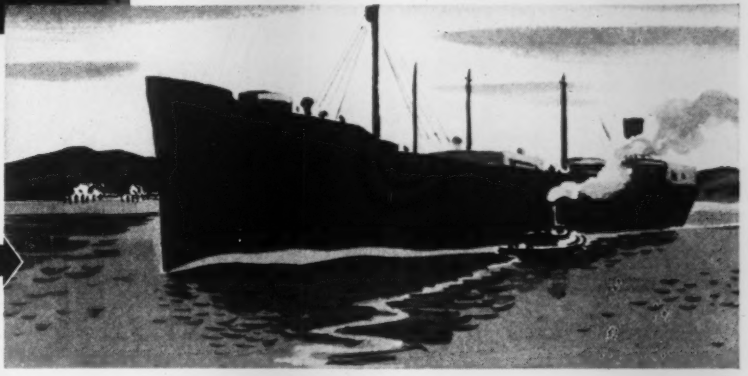

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loading and stresses; footing; superstructure; towers; girders; girder bearings; spiral reinforcement; expansion joints; roadway slab; deck reinforcement; roadway drainage.

HIGHWAY ENGINEERING, WAR TIME. Roads Under War Restrictions—I. *Eng. News-Rec.*, vol. 129, no. 15, Oct. 8, 1942, pp. 484–488. Survey of construction as well as curtailed road development in United States; present article gives experiences of state highway departments in meeting demands for new and strategic roads despite critical materials; specifications have been modified and some projects shelved for later construction.

JOINTS. Double-Barreled Economy—Early Correction of "Pumping Joints" Conserves Both Pavement and Tires, J. W. Poulter. *Roads & Streets*, vol. 85, no. 9, Sept. 1942, pp. 49–51. Early correction of pumping joints, primarily as measure for conservation of vital war materials; saving is not limited to cement and reinforcing steel and labor, but extends to vehicles using road, particularly to heavy vehicles, and most particularly (but not exclusively) to tires.

MAINTENANCE AND REPAIR. Tar Carpets and Surface Dressing as Methods of Road Maintenance in Wartime. With Special Reference to "Wartime Road Note No. 1," E. W. H. Vallis. *Surveyor*, vol. 101, no. 2644, Sept. 25, 1942, pp. 327–328. Extracts from pamphlet issued by Road Research Laboratory in cooperation with Ministry of War Transport, which presents findings of research and practical experience in connection with use of tar carpets and tar spraying of roads.

RAILROAD CROSSINGS. Rock Springs, Wyoming, Subway-Viaduct Project, D. P. Miller. *Pub. Works*, vol. 73, no. 10, Oct. 1942, pp. 11 and 70–71. Construction by city and railroad, with federal aid, of underpass, overpass, and subway to terminate interference with crossing traffic; absorptive concrete form lining used.

RAILROAD CROSSINGS, GRADE SEPARATION. Dunkirk Grade Separation Project Has Interesting Features. *Ry. Age*, vol. 113, no. 12, Sept. 19, 1942, pp. 445–448. New York Central work in western New York entailed construction of bridges across seven streets and elimination of 13 crossings; situation prior to changes; pre-cast cribbing used; passenger facilities; details of bridges; construction procedure; avoiding hindrance to traffic; grading.

ROAD MATERIALS, BITUMINOUS. Performance Tests for Road Tars. *Surveyor*, vol. 101, no. 2641, Sept. 4, 1942, pp. 303. Account of laboratory performance tests of road tars with view to revision of existing standards; factors affecting behavior of tars, setting and weathering, road tests, and preparation of tars discussed. Before Soc. Chem. Industry and Instn. Mun. & County Engrs.

SEWERAGE AND SEWAGE DISPOSAL

BIOFILTRATION PROCESS. Biofiltration Studies at New York University, G. P. Hanna, Jr., A. Phimister and R. Eliassen. *Sewage Works Eng.*, vol. 13, no. 8, Aug. 1942, pp. 391–394. Results of first phase of biofiltration research conducted on 10-gpm pilot plant installed in Sanitary Engineering Research Laboratory at New York University.

DISPOSAL PLANTS, CONTROL. Applications of Laboratory Data in Plant Control at Minneapolis–St. Paul Sewage Treatment Works, K. L. Mick. *Sewage Works J.*, vol. 14, no. 5, Sept. 1942, pp. 937–952. Paper described applications of laboratory data in various phases of plant operation at Twin Cities sewage treatment works; oxygen balance computations; simple specific gravity test for raw sludge pumpings control described; procedure for providing relatively frequent checks on chemical dosage for sludge conditioning; monthly overall solids balance for 1941 presented and discussed. Bibliography.

DISPOSAL PLANTS, CAIRO, EGYPT. Baffle Walls Before Inlets of Travis Hydrolytic Tanks and What They Do at Cairo, Egypt, M. Raef. *Sewage Works J.*, vol. 14, no. 5, Sept. 1942, pp. 961–963. Problem of increasing settling efficiency of six Travis tanks solved by constructing wooden baffle walls at inlets of tanks.

DISPOSAL PLANTS, GREENFIELD, MASS. Economy in Design and Operation Stressed at Greenfield, E. S. Chase and F. L. Flood. *Sewage Works Eng.*, vol. 13, no. 8, Aug. 1942, pp. 386–390. Plant designed for tributary population of 20,000; average sewage flow of 100 gal per capita per day; description of plant equipment and operating details given.

DISPOSAL PLANTS, MINNEAPOLIS-ST. PAUL. Plant Operation at Minneapolis–St. Paul, J. C. Sager. *Sewage Works J.*, vol. 14, no. 5, Sept. 1942, pp. 953–960. Plant consists of screen and grit chambers, flocculating and settling tanks, effluent filters, all facilities for chemical treatment, pre- and post-chlorinating, sludge concentration tanks, vacuum filtration and incineration of sludge with all necessary appurtenances; paper confined to practical aspects of plant operation.

DISPOSAL PLANTS, LOCKPORT, N.Y. Dilution by Canal Water Permits Primary Treatment at Lockport, W. R. Drury. *Sewage Works Eng.*, vol. 13, no. 8, Aug. 1942, pp. 395–398. Problems of design, construction, and operation of Lockport sewage system; city is underlayed with rock and is bisected by State Barge Canal; industrial load is heavy and diversified; author tells how various problems were met and solved.

DISPOSAL PLANTS, OPERATION. Operating Sewage Treatment Plants in Westchester County, N.Y. *Pub. Works*, vol. 73, no. 10, Oct. 1942, pp. 21 and 24. Notes on nine systems in operation in this county; operating data for Mamaroneck plant given.

DISPOSAL PLANTS, UNITED STATES. Sewage Treatment Plants in U.S. *Sewage Works Eng.*, vol. 13, no. 5, May 1942, pp. 247–251. Survey of all sewage treatment plants and sewer systems in United States; tabulations of sewerage data include all communities having organized sewer systems serving resident population of 100 or more people in Alabama, Arizona, Arkansas, and California.

INDUSTRIAL WASTE. Selection of Dilution Water for Determination of B.O.D. of Industrial Wastes, C. N. Sawyer and A. E. Williamson. *Sewage Works J.*, vol. 14, no. 5, Sept. 1942, pp. 1000–1020. Report on results of research to find some means of establishing which of proposed formulas for dilution waters is most suitable for determining of industrial wastes; preliminary investigations were made with raw, neutralized, and lime-treated waste sulfite liquor to determine effect, if any, of variation in pH of waste on results.

SEWAGE ANALYSIS. Estimation of Coliform Bacteria in Raw and Chlorinate Sewage by Means of Different Media, G. E. Simons and R. W. Simpson. *Sewage Works J.*, vol. 14, no. 5, Sept. 1942, pp. 991–999. Report on studies which included comparison of eosin methylene blue agar with brilliant green bile lactose broth as confirmatory media, comparison of presumptive lactose gas formers, comparison of direct planting in brilliant green bile lactose broth, and lauryl sulfate tryptose broth; few tests using violet-red-bile agar as direct counting medium. Bibliography.

SEWAGE TANKS. Experience in Separate Sedimentation Tank Operation. *Sewage Works J.*, vol. 14, no. 5, Sept. 1942, pp. 1075–1095. Review of primary sedimentation tank operation experience based on data and information obtained from sewage treatment works of various types and sizes.

SEWAGE TANKS. Something New in Settling Tank Design, H. Moore. *Eng. News-Rec.*, vol. 129, no. 15, Oct. 8, 1942, pp. 502–504. Circular, two-story type sewage-settling tank recently installed at summer camp in Illinois, represents departure from standard practice; one advantage over rectangular tank is said to be greater ratio of surface area to depth, hence better sedimentation; of special interest is concrete construction without use of reinforcing steel.

STRUCTURAL ENGINEERING

BEAMS, CONCRETE. Influence of Pre-Stressing Reinforced Concrete Beams on Their Resistance to Shear, R. H. Evans and G. Wilson. *Structural Engr.*, vol. 20, no. 8, Aug. 1942, pp. 109–122. Discussion of effect of horizontal pre-stress on magnitude of diagonal cracking loads of concrete beams having no shear reinforcement; effect of pre-stressing vertical stirrups on diagonal cracking loads of beams having no horizontal pre-stress; loss of initial pre-stressing force in both horizontal stress; loss of initial pre-stressing force in both horizontal and shear reinforcement due to shrinkage, strain, and creep of concrete.

FRAMED STRUCTURES, STRESSES. Methods of Computing Moments in Reinforced Concrete Building Frames, G. W. Stokes. *Structural Engr.*, vol. 20, no. 7, July 1942, pp. 93–100. Comparison of moments in beams and columns which result from application of three methods of computation sanctioned in LCC Memorandum (1938) and expression of these methods in diagram form; comparison of alternative methods of calculating end moments in beams and columns for monolithic frame.

TRUSSES, WOODEN. Fast Truss Fabrication. *Eng. News-Rec.*, vol. 129, no. 13, Sept. 24, 1942, pp. 440–441. Mass production methods were developed for fabricating 1,050 timber trusses, mostly 50-ft spans, at ordnance plant, where average of 28 trusses requiring 15,000 fbm lumber each were turned out per eight-hour shift; production on fabricated wood columns was more than double truss rates.

WALLS, EARTH. Soil Admixtures for Earth Walls, R. L. Patty. *Agric. Eng.*, vol. 23, no. 9, Sept. 1942, pp. 291–294. In research studies of earth construction at South Dakota Agricultural Experiment Station, various materials were mixed with soil and their effect noted; admixtures generally affect strength and weather resistence of arth wall; dependable and accurate tests for weather-resistant soils developed at South Dakota station, and tables have been worked out for quality ratings and for recommended amounts of sand admixtures for improving low quality soils.

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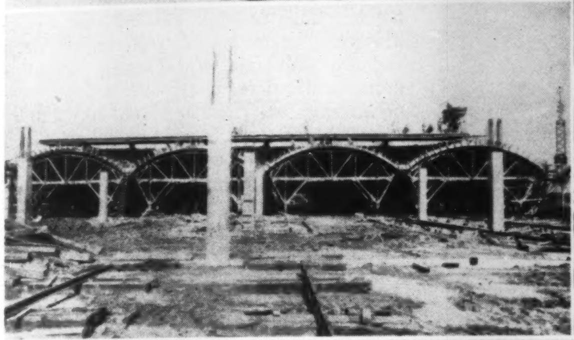

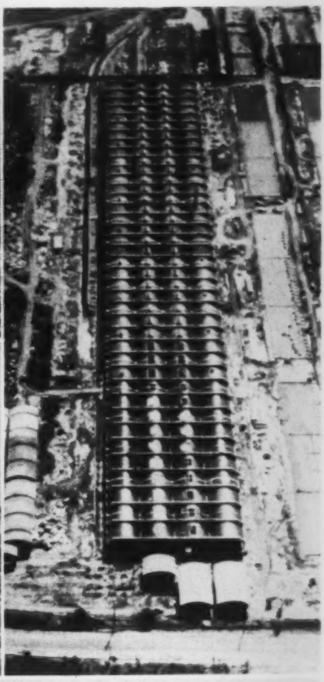

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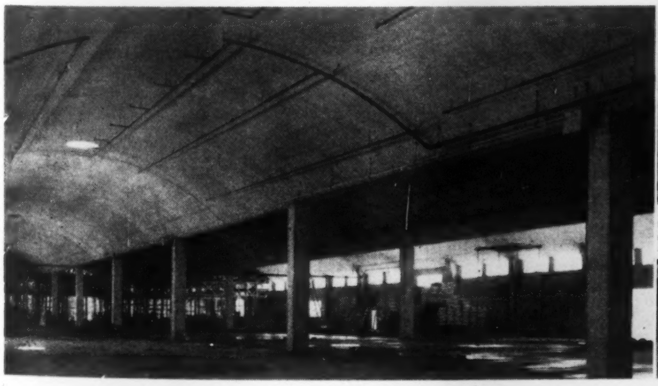

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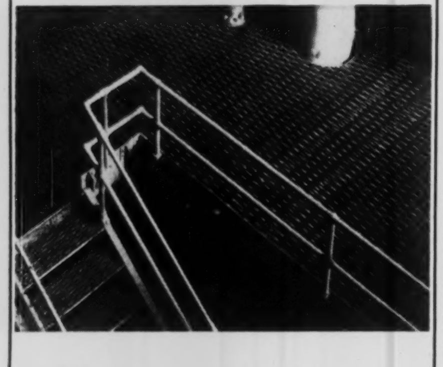

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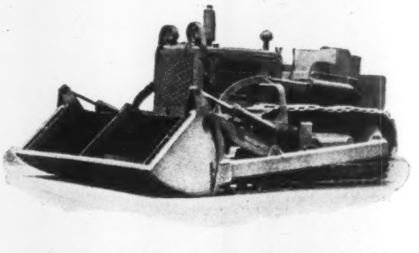

Hydraulically controlled from the driver's seat, it digs, carries or floats material, dumps it, cuts smoothly, and spreads evenly. Depth of the cut is regulated by the raising and lowering of the clam. By moving forward, the dirt "boils" into the shovel, leaving a level footing for the tractor at all times. Either end of the bull clam may be tilted independently, from the driver's seat, while the tractor is in motion. The shovel is built close to the tractor and is perfectly balanced.

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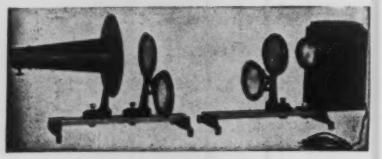

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Literature Available

A-C WELDING—Speed is increased 20 to 30 per cent and power costs are cut one-third with Flexarc A-C Welders, according to the descriptions in a new booklet by Westinghouse. A complete line of welders, with current ratings from 100 to 500 amperes, is described and illustrated in the booklet, B-3136, Dept. 7-N-20, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Penna.

CENTRIFUGAL PUMPS—Included in Bulletin B6059-H are pump types for every purpose—single and double suction, single and multi-stage, mixed and axial flow, combined Allis-Chalmers units and special pumps to solve special problems. Recommended applications for the one-package pump unit, the Allis-Chalmers Electrifugal, are also included. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

CENTRIFUGAL PUMPS—A new Economy Pump, Type SCV, is announced and thoroughly described in Catalog D2-1042. The booklet covers constructions, dimensions, specifications, and selection tables. Economy Pumps, Inc., Hamilton, Ohio.

CIRCUIT BREAKERS—15,000-volt oil circuit breakers for indoor service, classes 150-TCR-3 and 250-TCR-3, are described and illustrated in a new 12-page publication, Catalog 3350, released by the Roller-Smith Co., Bethlehem, Penna.

DRAINAGE PIPE—The emergency wood pipe made by Armco is interestingly covered in a booklet titled, "What it is. . . . Where to use it." Armco Drainage Products Association, Middletown, Ohio.

PAINTS—Wax-Impregnated Paints—Why they are impregnated with wax—What makes them economical—and Where they are used—are the facts contained in a new booklet by S. C. Johnson & Son, Inc., Racine, Wis.

ROLLING DOORS—A general catalog illustrates all upward-acting doors, rolling and sliding grilles. It gives complete information on recent designs which substitute wood for the critical materials, including wood rolling doors; wood vertical lift doors in single, two, and three sections; bi-fold doors; and wood canopy doors. Cornell Iron Works, Inc., 36th Ave. and 13th St., Long Island City, N.Y.

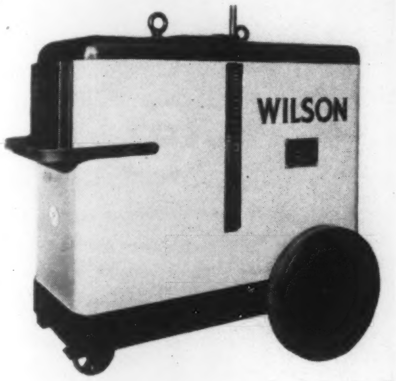
SHOVEL—A new 12-page illustrated catalog, No. 1943, has been published by Link-Belt-Speeder Corporation, 301 W. Pershing Road, Chicago, on their $1^{1}/_{4}$-yd heavy-duty model LS-120 crawler shovel, crane, dragline.

SURVEYING INSTRUMENTS—The engineering and surveying instruments manufactured by Warren-Knight Co., 136 N. 12th St., Philadelphia, Penna., are described and illustrated in a new 56-page catalog.

WIRE AND WIRE PRODUCTS—This is the title of a brief but instructive catalog of metal conveyor belts, fences and gates, perforated metals, springs, welded fabrics, wire lath, wire ropes, and woven wire screens. Wickwire Spencer Steel Co., 500 Fifth Ave., New York, N.Y.

Improved AC Welder

A new AC transformer type welding machine that combines safety with operating efficiency is announced by Wilson Welder and Metals Co., Inc., 60 East 42nd St., New York, N.Y. The most interesting feature of the new Wilson "Bumble Bee" AC welder is its low open-circuit voltage, automatically and positively maintained. Two primary coils are used instead of the usual one, with a magnetic contactor in the circuit of one primary. Each primary contributes approximately 42 volts to the open-circuit voltage, which is actually 84 to 85 volts. However, when the machine is idle one primary is automatically cut out, restricting the open-circuit value to 42 volts.



When the operator draws an arc, this open-circuit potential of 84–85 volts enables him to establish his arc quickly and begin welding. Most welding operations are performed at between 32 and 40 volts. When welding is completed and the operator pulls out or lengthens his arc, the arc voltage rises. The moment it reaches 45 volts, the contactor opens and cuts out one primary, leaving only 42 volts in the open circuit.

Several other improvements are incorporated in the new Wilson "Bumble Bee." Power factor correction is provided with built-in capacitors on all four sizes—300, 500, 750, and 1,000 amperes—resulting in a power factor of 100% to 86% (lagging) over the popular working range. In addition, the Wilson "Bumble Bee" is portable, and its 18-in. width permits easy passage through narrow doors. It has dual voltage connections for either 220 or 440 volts and thermal overload protection provided by a cutout coil buried in the winding. A single hand wheel control gives an infinite number of current adjustments throughout the NEMA range.

Drafting Room Trimmer

A simple but efficient trimming machine for use on drawings, tracings, or blueprints is that recently developed by the Edi Trimming Machines, 609 W. 105th St., New York, N.Y. The machine is available in four sizes, to trim sheets from 25 to 55 in. Margins of $^3/_8$ to 2 in. are automatically secured. Operation is manual, quite simple, and cost of maintenance is negligible.

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Two new models of Roller-Smith Precision Balances have been developed to meet the need for an accurately weighing instrument that can be used by semi-skilled workers. These balances, which are available in various sizes for weights ranging from less than 3 mg to more than 50 grams, are modified designs of the Roller-Smith Model B Balance, which has been used in industrial plants and laboratories for a number of years.

In these new designs the Model B-1 is available in double-hook type only, while the Model MB can be furnished in single-hook or double-hook types. The MB Balance is provided also with a weighing chamber to protect the hook and weighing sample from drafts. Both have a guaranteed accuracy of $^1/_5$ of 1 per cent.

In the single-hook balance, the material to be weighed is hung on the hook and the index lever moved until the parallex pointer fastened to the beam indicates zero. The index pointer attached to the index lever then indicates the weight of the object. Double-hook balances operate in the same manner except that the second hook is provided so that counterweights can be used to increase the capacity of the balance to a maximum of three times normal. Complete information is contained in Catalog 4550, which can be obtained from the Roller-Smith Company, Bethlehem, Penna.

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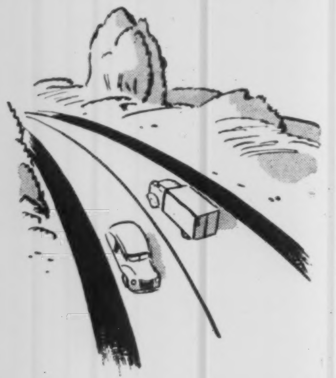

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Wilson, Robert Folsom (Jun. '42), 2d Lt., Corps of Engrs., U.S. Army, Centerville, Utah.

Wilson, Wilbur Kenneth (Jun. '42), Ensign CEC, U.S.N.R., Box 704, Malin, Ore.

Witt, Harry Robert (Jun. '42), Ensign, CEC, U.S.N.R., 1022 Normal St., Chico, Calif.

Wright, Charles William (Jun. '42), 2d Lt., U.S. Army, 6 Vine St., Cohoes, N.Y.

Youngs, Gilbert Ainsworth (Assoc. M. '42), Capt., Corps of Engrs., U.S. Army, Box 192, Bryan, Tex.

Membership Transfers

Baffa, John Joseph (Jun. '35; Assoc. M. '42), Asst. Engr., Elson T. Killam, 142 Maiden Lane, New York (Res., 341 Ninety-Ninth St., Brooklyn), N.Y.

Brush, Gorton William (Assoc. M. '30; M. '42), Director of Eng., Isolantite, Inc., Belleville (Res., Tudor Hall, Englewood), N.J.

Charles, John Roy (Jun. '39; Assoc. M. '42), Dist. Engr., Layne-New York Co., Inc., 6418 Jackson St., Pittsburgh, Pa.

Connell, Harry Hubert (Assoc. M. '35; M. '42), Chf. Engr., Wilson & Co., 215 Ash St., Salina, Kans.

Friedman, Joseph Lyon (Jun. '34; Assoc. M. '42), Technical Asst. to Gen. Mgr., Kaiser Co., Inc., Box 1632, Richmond, Calif.

Gregg, Duncan Smith (Jun. '37; Assoc. M. '42), Gen. Supt., Columbia Constr. Co., 1300 West 7th St. (Res., 734 Armando Drive), Long Beach, Calif.

Groves, John Meybin (Jun. '37; Assoc. M. '42), 1st Lt., Corps of Engrs., U.S. Army, Kaylor, Pa.

Hall, Albert Edmund Stockdale (Assoc. M. '21; M. '42), Prin. Archt. and Civ. Engr., E. I. du Pont de Nemours & Co., 10th and Market Sts. (Res., 916 Blackshire Rd.), Wilmington, Del.

Heard, Garland Wilson (Jun. '36; Assoc. M. '42), Chf. Surveyor, Charles T. Main, Inc., Camp McCain, Grenada, Miss.

Jakkula, Arne Arthur (Jun. '28; Assoc. M. '36; M. '42), Prof., Structural Eng., Agri. and Mech. College of Texas, College Station, Tex.

Johnson, Elmer George (Assoc. M. '38; M. '42), Chf. Engr., Bates & Rogers Constr. Corp., Box 39, Provo, Utah.

Jove, Jose Antonio (Jun. '38; Assoc. M. '42), San. Engr., Ministerio de Sanidad, Sur 4, No. 87, Caracas, Venezuela.

Kehart, Martin William (Assoc. M. '32; Assoc. M. '42), Lt. Comdr., CEC, U.S.N.R., Public Works Officer, Farragut Naval Training Station, Farragut, Idaho.

Kumpe, George (Jun. '35; Assoc. M. '42), Lt. Col., Corps of Engrs., U.S. Army, 3d Battalion, 21st Engrs., Army Air Base, Richmond, Va.

Myers, Earl Ira (Assoc. M. '27; M. '42), Cons. Civ. Engr., 337 Law Bldg., Kansas City, Mo.

Sanzenbacher, William Phillip (Jun. '37; Assoc. M. '42) (Forster, Wernert & Taylor), 735 Nicholas Bldg., Toledo, Ohio.

Schoeller, Charles Philip (Jun. '35; Assoc. M. '42), Mgr., Supply Dept., Pacific Naval Air Base Contrs., Box 2459 (Res., Pacific Club), Honolulu, Hawaii.

Stepleton, Harold Austin (Assoc. M. '29; M. '42), Cons. Engr., H. P. Jones & Co., 606 Toledo Trust Bldg., Toledo, Ohio.

Stevens, James Winlock (Jun. '38; Assoc. M. '42), Designing Engr., State Highway Dept., State Highway Bldg. (Res., 3215 East Ave.), Austin, Tex.

Uffelman, Thomas Neil, Jr. (Jun. '39; Assoc. M. '42), Ensign, CEC-V (S), U.S.N.R., 1012 Eighteenth Ave., South, Nashville, Tenn.

Wyant, Zint Elwin, Jr. (Jun. '33; Assoc. M. '42), 1st Lt., Corps of Engrs., U.S. Army, 2516 Maryland Ave., Topeka, Kans.

Reinstatements

Anderson, Andrew Matthew, Assoc. M., reinstated Jan. 5, 1943.

Dunkel, John Jacob, Assoc. M., reinstated Dec. 9, 1942.

Guyton, Moses Josiah, M., reinstated Jan. 6, 1943.

Johnson, Arthur Albert, M., reinstated Dec. 30, 1942.

Jonas, Frederick, Jun., reinstated Jan. 6, 1943.

Martin, James Allan, Jun., reinstated Jan. 6, 1943.

Moulton, George Lewis, M., reinstated Jan. 4, 1943.

Spurney, Felix Emanuel, Assoc. M., reinstated Dec. 10, 1942.

Straub, Ernest Joseph, Assoc. M., reinstated Dec. 28, 1942.

Symonds, George R.B., M., reinstated Jan. 6, 1943.

Trask, George Francis Donnell, M., reinstated Dec. 29, 1942.

Willis, Merton Horatio, Assoc. M., reinstated Oct. 9, 1942.

Resignations

Fisher, John Lerg, Jun., resigned Dec. 31, 1942.

Focht, Ralph Garfield, M., resigned Dec. 31, 1942.

Furness, Lawton Williams, Assoc. M., resigned Dec. 31, 1942.

Holcomb, Alpheus Elton, M., resigned Dec. 14, 1942.

Jewell, Albert Hartwell, M., resigned Dec. 31, 1942.

Kienle, John Aspin, Assoc. M., resigned Dec. 31, 1942.

Miller, Harry Hershey, Assoc. M., resigned Dec. 31, 1942.

Murphy, James Francis, Assoc. M., resigned Dec. 31, 1942.

Norcom, George Dusenbury, Assoc. M., resigned Dec. 31, 1942.

Norton, Robert Arthur, Assoc. M., resigned Dec. 31, 1942.

Phillips, Edwin William, Assoc. M., resigned Dec. 11, 1942.

Raynor, Leroy Preston, Assoc. M., resigned Dec. 31, 1942.

Reeves, Austin Hunsicker, Assoc. M., resigned Dec. 31, 1942.

Smith, George Robert, Jun., resigned Dec. 31, 1942.

Straus, Howard, Jun., resigned Dec. 31, 1942.

Wharf, Allison James, M., resigned Dec. 31, 1942.

Applications for Admission or Transfer

Condensed Records to Facilitate Comment from Members to Board of Direction

February 1, 1943 Number 2

The Constitution provides that the Board of Direction shall elect or reject all applicants for admission or for transfer. In order to determine justly the eligibility of each candidate, the Board must depend largely upon the membership for information.

Every member is urged, therefore, to scan carefully the list of candidates published each month in Civil Engineering *and to furnish the Board with data which may aid in determining the eligibility of any applicant.*

It is especially urged that a definite recommendation as to the proper grading be given in each case, inasmuch as the grading must be based upon the opinions of those who know the applicant personally as well as upon the nature and extent of his professional experience. Any facts derogatory to the personal character or professional reputation of an applicant should be promptly communicated to the Board.

Communications relating to applicants are considered strictly confidential.

The Board of Direction will not consider the applications herin contained from residents of North America until the expiration of 30 days, and from non-residents of North America until the expiration of 90 days from the date of this list.

MINIMUM REQUIREMENTS FOR ADMISSION

Grade	General Requirement	Age	Length of Active Practice	Responsible Charge of Work
Member	Qualified to design as well as to direct important work	35 years	12 years	5 years RCM*
Associate Member	Qualified to direct work	27 years	8 years	1 year RCA*
Junior	Qualified for sub-professional work	20 years	4 years	
Affiliate	Qualified by scientific acquirements or practical experience to cooperate with engineers	35 years	12 years	5 years RCM*

* In the following list RCA (responsible charge—Associate Member standard) denote, years of responsible charge of work as principal or subordinate, and RCM (responsible charge—Member standard) denotes years of responsible charge of IMPORTANT work, i.e., work of considerable magnitude or considerable complexity.

APPLYING FOR MEMBER

Argraves, Newman Edward, Dorchester, Mass. (Age 37) (Claims RCA 4.3 RCM 5.4) March 1940 to date Design Engr., Haller Eng. Association, Inc.; previously with Stone & Webster Eng. Corporation, as Field Engr., Structural Designer, and Senior Structural Designer.

Baillie, David Gemmell, Jr. (Assoc. M.), Brooklyn, N.Y. (Age 48) (Claims RCA 7.6 RCM 9.8) April 1936 to date with New York City Tunnel Authority, as Asst. Engr. and Senior Civ. Engr.

Braddock, Edward, Minneapolis, Minn. (Age 40) (Claims RCA 3.7 RCM 9.4) March 1942 to date Supervisor at Twin Cities ordnance plant; previously Utilities Engr., Foley Bros., Inc., and Walbridge, Aldinger Co.; Special Agt. and Res. Engr., PWA; Supt., WPA; Project Engr., RA.

Bray, Oscar Simon (Assoc. M.), Boston, Mass. (Age 37) (Claims RCA 6.0 RCM 3.9) May 1941 to date Project Engr. (Structural), Jackson & Moreland, Engrs., Boston; previously

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Brown, Alec Taylor, Orangeburg, S.C. (Age 44) (Claims RCA 5.0 RCM 11.6) May 1942 to date Civ. Engr. (Lt. Commdr.), CEC, U.S.N.R., Navy Yard, New York, Public Works Div.; previously Res. Engr., Santee-Cooper Power and Navigation project, South Carolina; Field Engr., Greenwood County, S.C.

Buja, Louis Marcus, New Orleans, La. (Age 43) (Claims RCA 11.4 RCM 5.8) Nov. 1922 to Aug. 1925 and July 1937 to date with City Engr.'s Office, as Asst. City Engr., Office Engr., and (since Dec. 1942) Office, Bridge and Structural Engr.; in the interim Engr. with John Riess, M. J. Flynn, and others, all in New Orleans.

Carder, William Burdes, Parkersburg, W.Va. (Age 44) (Claims RCA 6.0 RCM 9.0) 1936 to date Service Engr. and Tech. Representative, Superior Cement Corporation, Portsmouth, Ohio; since 1937 also Secy., Chf. Engr., and Member of Board of Directors, Roanoke (Va.) Ready Mix Concrete Corporation.

Crandall, Howard Lawrence (Assoc. M.), Halethorpe, Md. (Age 43) (Claims RCA 6.2 RCM 13.0) June 1940 to date Structural Engr., Crout, Snyder & Crandall, Cons. Engrs., Baltimore; previously with Pennsylvania Water & Water Power Co., Baltimore.

Cutler, Myrton Harris, Boston, Mass. (Age 47) (Claims RCA 7.0 RCM 13.0) Jan. 1923 to date with Stone & Webster, Inc. (Stone & Webster Eng. Corporation) as Engr. and Structural Engr.

Dibert, Herbert McMillen, Troy, N.Y. (Age 58) (Claims RCA 7.0 RCM 20.0) Feb. 1911 to date with W. & L. E. Gurley, Eng. Instrument Manufacturers, Troy, N.Y., as Civ. Engr., Director, and (since 1922) Secy. and Treas., Director and Gen. Sales Mgr.

Douglas, Clarence Joseph, Ft. Belvoir, Va. (Age 35) (Claims RCA 3.6 RCM 5.0) Sept. 1933 to Feb. 1936 and Aug. to Oct. 1936 on duty with CCC, and Nov. 1940 to date with Corps of Engrs., U.S. Army, at present Lt. Col., being Asst. Training Supervisor and Training Supervisor; in the interim with Loon Lake (N.Y.) Hotel Co., and New York State Dept. of Correction at Clinton Prison, Dannemora, N.Y.

Duvall, Arndt John (Assoc. M.), St. Paul, Minn. (Age 38) (Claims RCA 5.8 RCM 6.9) March 1926 to date with Toltz King & Day and Smith, Hinchman & Grylls, or Toltz, King & Day, Inc., Engrs. and Archts. as Engr., San. Engr., and since April 1942 Res. Director for an air base.

Fenwick, Herbert Sidney, Jackson, Mich. (Age 45) (Claims RC 12.8 D 15.5) April 1925 to date with Consumers Power Co., Jackson, Mich., at present as Special Engr., Gas Eng. Dept.

Harrje, Henry John (Assoc. M.), Jacksonville, Fla. (Age 41) (Claims RCA 7.9 RCM 11.1) March 1942 to date Asst. to Chf. Engr., Hope Eng. Co.; previously Structural Engr., E. I. Du Pont Co., R. & H. Chemical Dept., Niagara Falls, N.Y.

Hayner, John Lewis, Ft. Wayne, Ind. (Age 38) (Claims RCA 2.8 RCM 6.3) Sept. 1938 to date Pres. and Chf. Engr., Ft. Wayne Structural Steel Co., previously with Bass Foundry & Machine Co.

Hewes, Frederick Roy (Assoc. M.), Arlington, Va. (Age 44) (Claims RCA 7.0 RCM 15.2) Nov. 1921 to date with U.S. Navy, as Asst. to Public Works Officer, Public Works Officer, Asst. to Head, and Head, Aviation Facilities Div., (and since Nov. 1942) Asst. Director, Atlantic Div., Bureau of Yards & Docks.

Hiatt, Alfred Ronald, Vicksburg, Miss. (Age 44) (Claims RCA 10.2 RCM 8.4) June 1932 to Sept. 1935 and Sept. 1936 to Sept. 1940 Jun. Engr., and Sept. 1940 to date Associate Engr. in Yazoo Planning Sec., U.S. Engr. Office; in the interim Res. Engr., Arkansas Highway Dept., Little Rock.

Jensen, Vernon Peter (Assoc. M.), Urbana, Ill. (Age 38) (Claims RCA 4.0 RCM 6.3) Sept. 1936 to date at Univ. of Illinois, at present as Research Associate Prof., Dept. of Theoretical and Applied Mechanics.

Jewett, John Quincy (Assoc. M.), Los Angeles, Calif. (Age 43) (Claims RCA 9.4 RCM 7.7) April 1940 to date Member of firm, Leeds, Hill, Barnard & Jewett, Cons. Engrs.; previously with Quinton, Code, & Hill-Leeds & Bernard as Asst. Engr., Designing Engr., and Associate.

Jones, Carlton Walter, Argentia, Newfoundland. (Age 52) (Claims RCA 12.4 RCM 9.5) Dec. 1941 to date Utilities Engr. and Eng. Coordinator, G. A. Fuller, Merritt, Chapman Scott Corporation, Contrs.; previously Engr., U.S. Naval Air Station, Quonset, R.I., and on Hope Island project in Narraganset Bay; private engineering work.

Loving, Harry Wallace, Washington, D.C. (Age 53) (Claims RCA 1.0 RCM 24.7) July 1940 to date with U.S. Army, as Chf., Fixed-Fee Branch, Constr. Div., Office of Quartermaster General, Chairman, Contract Board (Negotiation Board), and (since Feb. 1942) Member, Constr. Contr. Bd., Office of Chf. of Engrs.; since July 1942 also Chf., Price Adjustment Sec., Constr. Div.; previously Executive Secy. and Mgr., Carolinas Branch, The Associated Gen. Contrs. of America, Charlotte, N.C.

Maier, William, New Orleans, La. (Age 39) (Claims RCA 7.9 RCM 7.6) May 1941 to date Dist. Engr., State Dept. of Public Works, Baton Rouge; Dec. 1936 to May 1940 and Oct. 1940 to May 1941 with City Engr.'s Office as Office and Constr. Engr.; in the interim Chf. Engr. and Gen. Supt., with A. N. Goldberg, Gen. Contr.

Merenbach, Simon, New York City. (Age 51) (Claims RCA 1.0 RCM 12.6) March 1942 to date Res. Engr., U.S. Engr. Office, New York Dist., War Dept., Ft. Slocum; previously Mgr. of Constr., Splendid Homes Corporation; Constr. Supt., Home Bldrs. of New Jersey.

Morton, John Ordway (Assoc. M.), Concord, N.H. (Age 40) (Claims RCA 1.3 RCM 13.8) April 1925 to date with New Hampshire Highway Dept., as Transitman, Chf. of Party, Soils Engr., Asst. Constr. Engr., and (since Sept. 1937) Constr. Engr.

Olson, Kenneth Miles, Danville, Ill. (Age 39) (Claims RCA 0.2 RCM 8.6) June 1942 to date Asst. Field Engr., Corps of Engrs., War Dept.; previously (10 years) in private practice as Mfrs. Representative and Consultant.

Owen, William Henry (Assoc. M.), Marshall, Mo. (Age 44) (Claims RCA 6.7 RCM 10.8) July 1942 to date Senior Engr. Asst. to Head of Field Eng. Bldg. Inspection Dept., Sunflower Ordnance Works, Eudora, Kans., for William S. Lozier, Inc.-Broderick & Gordon, Archt.-Engr.-Mgr.; previously Area Engr., Kansas Ordnance Plant Area, Parsons, Kans., for Consoer, Townsend & Quinlan & Battey & Childs, Archt., Engrs.; Asst. Engr. and Associate Engr., Panama Canal, Gatun, C.Z.

Pierce, Dewey Orville, Seymour, Ind. (Age 44) (Claims RCA 11.1 RCM 9.1) March 1942 to date with Warren & VanPraag, as Design Engr., and (since May 1942) Chf. Engr. of Constr.; previously Chf. Field Engr., and Mgr., Municipal Design Dept., Robert & Co.; Chf. Draftsman, Widmer Eng. Co.; Res. Engr. Inspector, PWA.

Prest, Kenneth Wallace (Assoc. M.), Tampa, Fla. (Age 36) (Claims RCA 3.2 RCM 5.7) May 1942 to date Capt., Corps of Engrs., U.S. Army; previously Engr., Div. of Defense Housing, FWA; Res. Engr., Hentz, Adler & Schutze, Archts.; with PWA.

Robichau, Harold Vincent (Assoc. M.), Boston, Mass. (Age 39) (Claims RCA 3.4 RCM 6.1) Oct. 1936 to date with Stone & Webster Eng. Corporation in charge of various work, at present on synthetic rubber projects.

Seaver, George Arthur, New Orleans, La. (Age 56) (Claims RCA 8.0 RCM 8.8) Sept 1909 to date with Geo. J. Glover and Geo. J. Glover Co., Inc., Gen. Contrs. (member, Board of Directors); Project Mgr. for U.S. Army and U.S. Navy.

Seghers, Guy Joseph (Assoc. M.), New Orleans, La. (Age 44) (Claims RCA 1.0 RCM 22.1) Oct. 1932 to date in private practice.

Shilts, Walter Leonard (Assoc. M.), Notre Dame, Ind. (Age 40) (Claims RCA 3.4 RCM 10.6) Sept. 1922 to date with Univ. of Notre Dame, since Sept. 1934 being Prof. of Civ. Eng. and since Sept. 1938 Head of Dept.

Simmons, Chester Thomas, Richmond Heights, Mo. (Age 47) (Claims RCA 0.6 RCM 9.6) Nov. 1940 to date with Fraser-Brace Eng. Co., Inc., Weldon Spring, Mo., as Asst. Coordinator and Office Mgr., and (since June 1942) Coordinator; previously Official Letterer, Rand-McNally & Co., San Francisco, Calif.; with Kansas Highway Comm., Topeka, in various capacities; Res. Engr., and Engr. Examiner, FEA of PW; Designer, City Engr.'s Office, Topeka, Kans.

Spence, Thomas Reese (Assoc. M.), College Station, Tex. (Age 47) (Claims RCA 13.8 RCM 9.9) Feb. 1938 to date with Agricultural & Mechanical Coll. of Texas, as Prof. of Civ. Eng., and (since Sept. 1939) Vice-Director, Texas Eng. Experiment Station.

Tongue, George Frederick, Dallas, Tex. (Age 51) (Claims RCA 10.0 RCM 15.1) June 1912 to Feb. 1916 and Nov. 1917 to date with Dallas Railway and Terminal Co. since Nov. 1917 as Asst. Engr. and Supt. of Ways and Structures.

Vermilya, Floyd Durland, Chicago, Ill. (Age 39) (Claims RCA 3.1 RCM 10.9) Sept. 1942 to date Field Engr., Sanderson & Porter, Engrs. & Constrs., New York City; previously Supt.-Engr., Minder Constr. Corporation; with FWA (WPA of Illinois) in various capacities.

Wilburn, Joseph Gustavus (Assoc. M.), Meadville, Pa. (Age 52) (Claims RCA 6.7 RCM 16.9) Nov. 1940 to date Office Engr., Fraser-Brace Eng. Co., Inc., Engrs. and Contrs., New York City; previously with Robert & Co., Inc., Engrs., Atlanta, Ga., as Structural Designer, etc.; with PWA, Little Rock, Ark.

APPLYING FOR ASSOCIATE MEMBER

Aaron, Henry Alfredo, Valledupar, Colombia, S.A. (Age 29) (Claims RCA 2.3) Sept. 1940 to June 1942 student, Louisiana State Univ.; previously with Ministry of Public Works, Bogota, Colombia.

Anderson, James Stuart, New York City. (Age 30) (Claims RCA 2.3 RCM 2.9) March 1940 to date with Minder Constr. Corporation, as Gen. Supt., Asst. Chf. Engr., Base Engr., and (at present) Chf. Engr.; previously Asst. Project Engr., Chas. DeLeuw & Co., Cons. Engrs., Chicago; Civ. and Res. Engr., Warren & Van Praag, Inc., Cons. Engrs., Decatur, Ill.

Anderson, Samuel William, Forest Hills, N.Y. (Age 42) (Claims RCA 14.8) April 1942 to date with Corps of Engrs., U.S. Army; previously with Herbert J. Krapp, Port Jefferson, N.Y.; Superv. Engr. with Miami (Fla.) Mun. Corporation, and East Hilton Housing Corporation, Newport News, Va.

Arning, Louis Henry (Junior), Wilmington, Del. (Age 32) (Claims RCA 6.5) April 1940 to date with E. I. Du Pont de Nemours & Co., as Cost Engr., Asst. Supt., and (since Aug. 1941) Supt., Div. Office, Gen. Constr. Div.; previously with U.S. Engr. Office, Rock Island, Ill., as Field Engr., Jun. Mech. Engr., and Supervisor.

Baker, Michael, Jr., Rochester, Pa. (Age 30) (Claims RCA 2.7 RCM 4.5) Oct. 1937 to March 1939 and June–Dec. 1939 Gen. Contr., and May 1940 to date Civ. Engr. & Surveyor, as Michael Baker, Jr.; in the interim Res. Engr., Chester Engrs.; Appraisal Engr., Pittsburgh Crucible Steel Co., Midland, Pa.

Barclay, James Wallace, Bailey's Bay, Bermuda. (Age 37) (Claims RCA 4.5 RCM 1.5) June 1934 to date with U.S. Engrs., as Jun. Engr. and Asst. Engr. at Zanesville, Ohio, Associate Engr. at Louisville, Ky., and (since May 1941) Senior Engr. and Engr., Bermuda.

Briggs, Howard Fansler, Fresno, Calif. (Age 46) (Claims RCA 18.1) May 1919 to date with California Div. of Highways, as Draftsman, Squad Leader, Asst. Chf. Draftsman, Chf. Draftsman, and (since April 1942) Dist. Office Engr.

Cassady, Earl Whitton, Ft. Wayne, Ind. (Age 36) (Claims RCA 5.5 RCM 7.7) April 1935 to date Asst. Dist. Engr. of Tests, Indiana Highway Comm.; previously Field Engr., Bureau of Materials and Tests, Indiana Highway Dept.

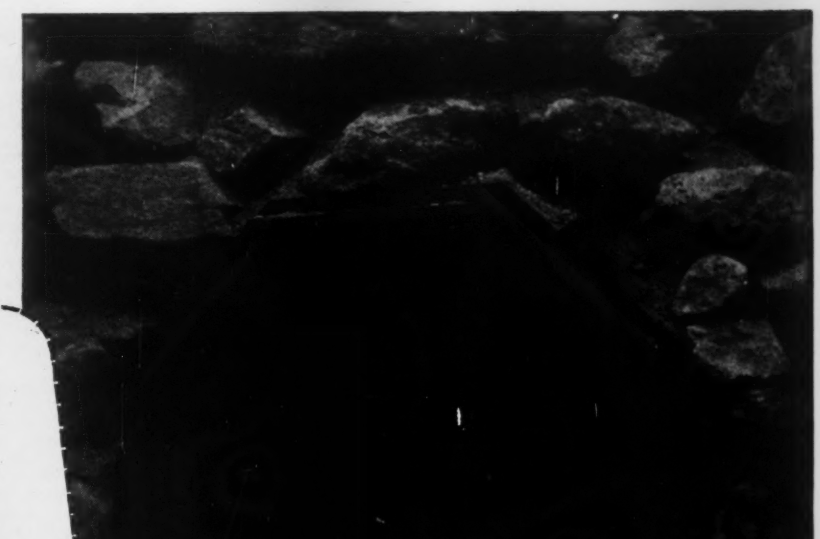
Chun, Edmund Hinyin, Omaha, Nebr. (Age 38) (Claims RCA 8.9 RCM 1.3) Nov. 1933 to date with U.S. Engr. Office, as Jun. Civ. Engr., Asst. Structural Engr., Associate Structural Engr., and (since Sept. 1942) Associate Civ. Engr.

Deakman, Homer Ward, Tenafly, N.J. (Age 48) (Claims RCA 24.4) 1924 to date Executive Vice-Pres., Deakman-Wells Co., Bldrs., Jersey City.

Essi, Vernon Ferris, Cleveland, Ohio. (Age 34) (Claims RC 10.9 D 3.8) Feb. 1942 to date Structural Designer, H. K. Ferguson Co.; previously Asst. to Drawing Room Mgr., Wilbur Watson & Assoc.; Asst. Structural Draftsman, Cuyahoga County Main Ave. Bridge Dept.

Evers, Charles Edmund, Jr., Shawnee, Kans. (Age 43) (Claims RCA 8.5 RCM 3.0) June 1942 to date Asst. Engr., Wm. S. Lozier, Inc.-Broderick & Gordon, Archt., Engr., Mgr., on Sunflower Ordnance project, De Soto, Kans.; previously Civ. Eng. Designer, Fraser-Brace Eng. Co.; Asst. Engr., Ohio Dept. of Highways, Cleveland; with WPA.

Ford, Paul Joseph, Port Neches, Tex. (Age 30) (Claims RCA 3.4) Oct. 1941 to date with Prack & Prack, Archts., Lone Star Ordnance Plant, Texarkana, Tex., as Engr.-Designer, Structural Designer, and (since Nov. 1942) Chf. Bldg. Inspector at Port Neches; previously Senior Structural Draftsman, H. K. Ferguson Co.; Field Engr., Constr. Q.M., Camp Livingston, La.; Engr., S and W Constr. Co., Camp Livingston; Rodman, Jun. Office Asst., and Asst. Bridge Designer, Texas Highway Dept.



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GARBER, PAUL JACKSON, Omaha, Nebr. (Age 45) (Claims RCA 1.9 RCM 6.0) May 1941 to date with U.S. Engr. Dist. Office, as Asst. Engr., and (since Jan. 1942) Specifications Engr.; previously with WPA, Des Moines, Iowa, as Jun. Engr., and Engr.

GIERASCH, AIDEN REDMOND (Junior), Ft. Belvoir, Va. (Age 33) (Claims RCA 7.1 RCM 1.6) July 1942 to date with U.S. Engr. Corps, as 2d Lieut. and (since Dec. 1942) 1st Lieut.; previously Engr., Jackson & Moreland, Consultants; Asst. Engr. and Associate Engr., National Park Service.

GIUSTO, JOHN BAPTIST, Port of Spain, Trinidad, B.W.I. (Age 45) (Claims RCA 18.3) 1935 to date with Public Works Dept., Trinidad; with Trinidad Elec. Co., Ltd.

GLACE, IVAN MAXWELL, JR. (Junior), Charlotte N.C. (Age 29) (Claims RCA 1.3 RCM 1.5) Oct. 1940–Aug. 1941 Engr., and April 1942 to date Civ. Engr., with J. N. Pease & Co., Engrs.-Archts.; in the interim Civ. Engr., R. H. Hunt Co., Archts., Chattanooga, Tenn.; previously Field Engr., T. M. Flanaghan, Contrs., Reading, Pa.; Asst. Engr., I. M. Glace & Associates, Harrisburg and Waynesboro, Pa.

GOLDSMITH, FRED, Crestwood, N.Y. (Age 49) (Claims RCA 20.3) July 1941 to date Supt. of Constr. on erection of P.S. 21 for New York City Board of Education; previously Project Mgr., AUS Housing Authority project, Newport News, Va.; Asst. Supt. and Paymaster, Manhattan approach, Queens Midtown Tunnel.

HOKE, WILBUR CHARLTON, Pine Bluff, Ark. (Age 28) (Claims RCA 4.1) Dec. 1941 to date with Sanderson & Porter, as Draftsman, and (since July 1942) Designer; previously Computer, Holway & Cochrane, Muskogee, Okla.; Inspector, Benham Eng. Co.; with Holway & Neuffer, Vinita, Okla.

KAMINSKI, WILLIAM STANLEY, Mobile, Ala. (Age 32) (Claims RCA 4.7 RCM 1.3) 1941 to date Lieut., Corps of Engrs., U.S. Army; previously with New York, New Haven & Hartford R.R., as Chainman, Clerk, and Structural Draftsman.

KENNEDY, RICHARD ROBERTS (Junior), San Francisco, Calif. (Age 33) (Claims RCA 4.6 RCM 1.6) Dec. 1936 to April 1937 Asst. Engr., and May 1938 to date Associate Engr., Clyde C. Kennedy, Engr.; previously with Quinton, Code, Hill-Leeds & Barnard, and with Metropolitan Water Dist. of Southern California.

KESSLER, HERBERT WILLY, Killeen, Tex. (Age 35) (Claims RC 5.6 D 2.9) Nov. 1942 to date Chf. Inspector, Federal Public Housing Authority; previously Constr. Engr., Thomas, Sharp, Welch and Goodwin, Archt.-Engrs., Dallas; Design Engr. Koch & Fowler, Archt.-Engrs., Dallas; with Texas Highway Dept.

KITCHEN, JOHN EVANS, Sacramento, Calif. (Age 38) (Claims RCA 8.0) Summer 1927 and Feb. 1928 to date with U.S. Engr. Dept., as Surveyman, Surveyor, Asst. Engr., Associate Engr. Engr. (Civ.), and (since Nov. 1942) Senior Engr. (Civ.).

LICHTENSTEIN, HARRY, New York City. (Age 53) (Claims RCA 26.0) Sept. 1941 to date with U.S. Engr. Office, since May 1942 as Res. Engr.; previously Asst. Supt., with Jos. Wein Co., New York City.

LYLE, LAWRENCE HENRY (Junior), Chicago, Ill. (Age 32) (Claims RCA 4.5) Jan. 1941 to date Bridge Draftsman, Atchison, Topeka & Santa Fe Ry.; previously Sales Engr., Calumet Bldrs., Inc., and Ludowici-Celadon Co.; Jun. Civ. Engr., and Project Engr., City of Chicago.

MEENAN, JAMES GALLAGHER (Junior), Pittsburgh, Pa. (Age 31) (Claims RCA 3.0 RCM 0.9) Dec. 1939 to date with United Eng. & Foundry Co., as Draftsman, and (since Oct. 1942) Service Engr.; previously Engr., Pittsburgh Industrial Eng. Co.

OCAMB, CHARLES EMERSON, Seattle, Wash. (Age 35) (Claims RCA 1.5 RCM 2.2) Dec. 1941 to date Chf., U.S. Engr. Office; previously with Horner & Wyatt, Cons. Engrs., Kansas City, Mo., as Detailer to Co-owner.

O'TOOLE, JOHN EDWARD, Birmingham, Ala. (Age 33) (Claims RCA 7.1) Sept. 1942 to date Chf. Office Engr., J. W. Goodwin & E. B. Van Keuren, Engrs. & Archts.; previously Constr. Engr., J. W. Goodwin Eng. Co.; with Alabama Highway Dept.

QUINN, IRVING (Junior), Cleveland, Ohio. (Age 32) (Claims RCA 3.1 RCM 0.6) March to July 1942 with Bluebonnet Constrs., Waco, Tex., and July 1942 to date with J. Cordon Turnbull, Cleveland, as Design Engr.; previously with Howard, Needles, Tammen & Bergendoff, and with Ash-Howard-Needles & Tammen.

REYNOLDS, ROBERT JACKSON, Louisiana, Mo. (Age 32) (Claims RCA 1.6 RCM 1.0) April 1941 to date with Hercules Powder Co., as Chf. of Party at Pulaski, Va., and (since Jan. 1942) Constr. Engr. on Missouri Ordnance Works; previously with Kentucky Highway Dept. as Chainman and Rodman, Levelman, Instrumentman, Tech. Inspector, and Jun. Engr.

REYNOLDS, XEN VESTAL, Oakland, Calif. (Age 44) (Claims RCA 18.3) July 1942 to date with Pacific Bridge Co., Shipyard No. 2, Alameda; previously supervising concrete work, contract for Costa Canal Sec., viaducts, highway paving, Govt. bomb shelters, etc.; Asst. on steel inspection, San Francisco–Oakland Bay Bridge.

RINEY, CLAUDE, Mt. Pleasant, Tex. (Age 43) (Claims RCA 12.6 RCM 4.5) Sept. 1929 to date (except March to Sept. 1933 not on engineering) with Texas Highway Dept., as Asst. Res. Engr., Res. Engr. and Senior Res. Engr.

RUSSELL, SPRUELL ALTON, Bay City, Tex. (Age 32) (Claims RCA 8.1) 1941 to date with Bay City, as City Engr. and Mgr. of Utilities; previously City Engr. and Supt. of Public Works, El Campo, Tex.; Gen. Foreman and Supt., Briggs-Killian Constr. Co., Pharr, Tex.

SCHNEIDER, HARRY HERBERT, Baltimore, Md. (Age 38) (Claims RCA 6.5) April 1934 to date Asst. to Dist. Engr., Bethlehem Steel Co.

TELLEPSEN, HOWARD TELLEF (Junior), Houston, Tex. (Age 29) (Claims RCA 3.7 RCM 1.0) Feb. 1935 to Aug. 1936 Estimator, and Aug. 1936 to date Vice-Pres., Tellepsen Constr. Co.

WAGNER, CLARENCE OSCAR, Denver, Colo. (Age 31) (Claims RCA 5.7) Sept. 1941 to date Asst. San. Engr., Whitman, Requardt & Smith, Baltimore, Md.; previously Asst. San. Engr., Benham Eng. Co., Oklahoma City, Okla.; Cons. Engr., Mun. Eng. & Equipment Co., Oak Park, Ill.

WALLER, HAROLD HENKLE, Seattle, Wash. (Age 53) (Claims RCA 16.6 RCM 7.7) Sept. 1942 to date with U.S. Army Engrs. as Civ. Engr.; previously Vice-Pres. and Treasurer, Hubbell & Waller Eng. Corporation, Engrs. & Contrs.

WILDSCHUTE, HENRY BALDWIN, Portsmouth, Va. (Age 33) (Claims RCA 3.1 RCM 0.4) April 1936 to date with Greeley and Hansen, Cons. Engrs., as Asst. Div. Engr., Party Chf., Div. Engr., Engr., and (since Feb. 1942) Res. Engr.

WONG, SIN-YUAN, New York City. (Age 30) (Claims RCA 4.9) Jan. 1942 to date Civ. Engr., Kansu Petroleum Production & Refining Administration, National Resources Comm., China; previously Asst. Engr., Suifu-Kunming Ry.; Sec. Engr., Yunnan-Burma Ry.; Asst. Engr., Hunan-Kwangsi Ry.

APPLYING FOR JUNIOR

BAIRD, WILLIAM CARDWELL, Rochester, N.Y. (Age 24) at present with CEC, U.S. Naval Reserve; previously with U.S. Engr. Office, Syracuse, N.Y.; Office Engr., The Panama Canal, Balboa Heights, Canal Zone.

KLEMA, ROY LESTER, Moscow, Idaho (Age 27) (Claims RCA 1.2) Sept. 1941 to date Instructor in Civ. Eng., Univ. of Idaho; previously Constr. Clerk, La Crosse Div., Standard Oil Co. of Indiana; Jun. Engr., City of Racine, Wis.

PACKARD, HARRY LESLIE, Mobile, Ala. (Age 31) April 1941 to date Constr. Engr., Doullut & Ewin, Mobile; previously Leadsman, Foreman, and Rodman, U.S. Engrs., Vicksburg, Miss.; Surveyor, East Carrol Parish Police Jury, Lake Providence, La.; Inspector, Highway Comm., Baton Rouge, La.

ROBERTSON, WILLIAM HOSEA, Vicksburg, Miss. (Age 30) (Claims RCA 3.9) May to Sept. 1942 Jun. Engr., and Sept. 1942 to date Asst. Engr., Mississippi River Comm.; previously Jun. Eng. Aide to Senior Eng. Aide, U.S. Waterways Experiment Station, Vicksburg.

SCOTT, RICHARD LUCAS, Gorgas, Ala. (Age 27) July 1936 to Aug. 1937 and May 1939 to date with Alabama Power Co. since Dec. 1939 as Chf. of Party; in the interim student.

SNOEK, STANFORD PHILLIP, San Francisco, Calif. (Age 23) (Claims RCA 0.4) July 1941 to date with U.S. Engrs., since Oct. 1942 as Asst. Engr., Soil Mechanics; previously Jun. Engr., Southern California Gas Co., Taft, Calif.

1941 GRADUATES

UNIV. OF CALIF.
(B.S. in C.E.)

	AGE
NOVIKOFF, GEORGE VICTOR	(25)

UNIV. OF KY.
(B.S. in C.E.)

COLLINSWORTH, EDWARD REX	(25)

1942 GRADUATES

UNIV. OF ARK.
(B.S.C.E.)

POWERS, CECIL HERMAN	(23)

UNIV. OF CALIF.
(B.S. in C.E.)

WELISCH, DAVID ALAN	(22)

CARNEGIE INST. TECH.
(B.S. in C.E.)

MARCIN, BENJAMIN GEORGE	(22)

COLL. OF CITY OF N.Y.
(B.C.E.)

ANDERSON, CHARLES ROBERT	(22)
EVERSLEY, FREDERICK WILLIAM, JR.	(25)
LARSON, ARTHUR HELMAR	(20)

DUKE UNIV.
(B.S. in Civ. Eng.)

BEESON, DONALD RICHARD, JR.	(21)

UNIV. OF KANS.
B.S. in C.E.

KUHNLEIN, ROBERT FRANCIS	(24)
LAMBERTON, HORACE CHRISTOPHER, JR.	(24)

NORTHEASTERN UNIV.
(B.S. in Civ. Eng.)

KILLAM, PAUL DICKSON	(22)

ORE. STATE COLL.
(B.S. in C.E.)

LASSEN, PHILIP VOORHEES	(25)

PA. STATE COLL.
(B.S. in Civ. Eng.)

SCHROYER, GEORGE BARTLEY, JR.	(21)

(B.S. in San. Eng.)

HENDRICKSON, ELLWOOD ROBERT, III	(21)

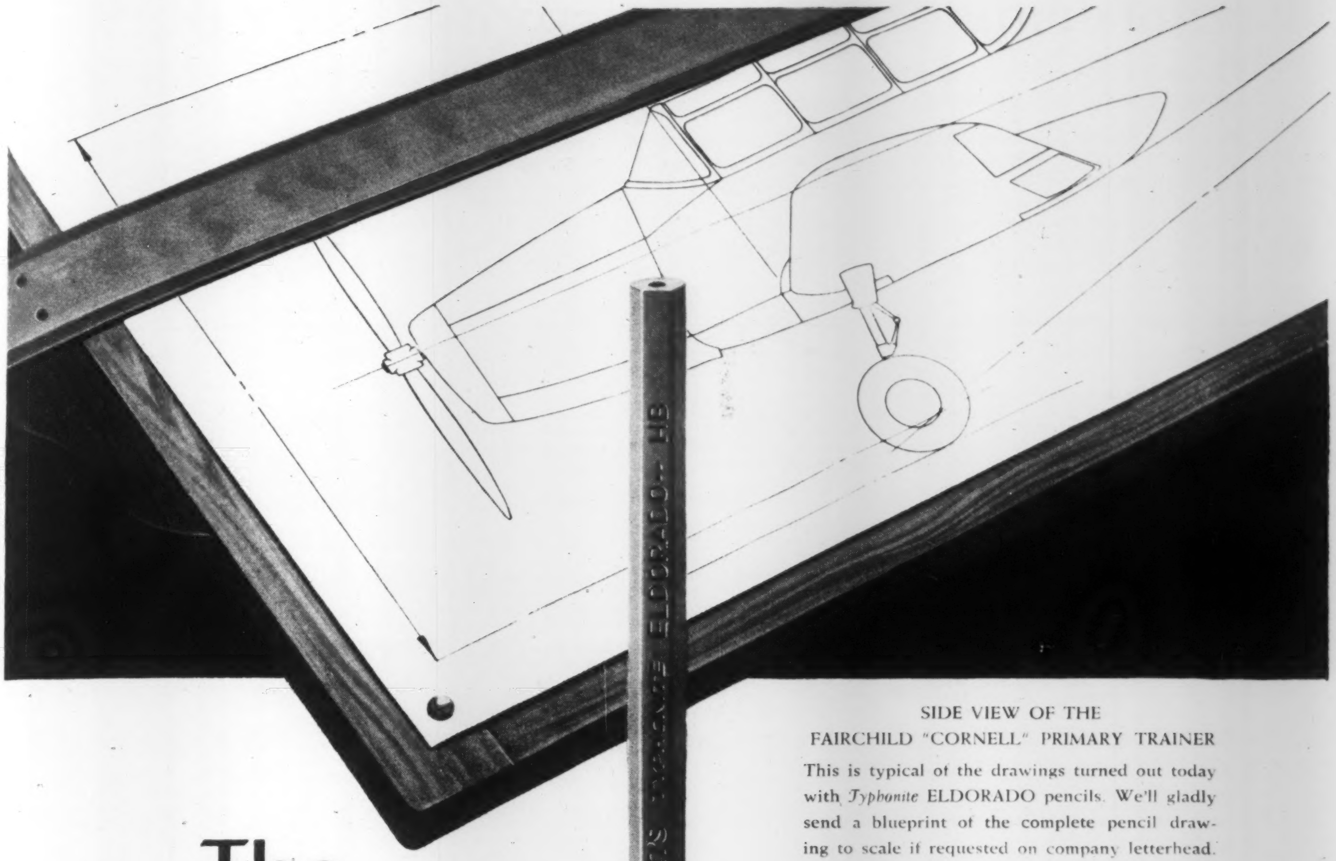
PURDUE UNIV.
(B.S.C.E.)

BALL, RICHARD THOMAS	(20)
BRANDT, CHARLES EDWARD	(22)
COOK, HAROLD ELMER	(21)
EASTERDAY, EVERETT EARL	(23)
JACKSON, ROBERT FRANCIS	(22)
JOHNSON, WARREN ALBIN	(21)
JONES, WILLIAM MATHIAS	(21)
KNUE, JOSEPH EDWARD, JR.	(21)
LANDER, JOHN ROBERT	(22)
LOVE, JAMES SOMMERS	(21)
MADDEN, JAMES ARTHUR, JR.	(21)
MYERS, NORMAN EUGENE	(26)
STREETER, KENNETH	(22)
TONKEL, MILLER J.	(23)
WATSON, JOE OWEN	(22)
YODER, WARREN GEORGE	(21)

UNIV. OF WASH.
(B.S. in C.E.)

BRANNIAN, JAMES DONALD	(25)
CLARK, SAMUEL HURST	(21)
FLOBERG, JOSEPH WILLIAM	(21)
SPARROW, GLEN THOMAS	(23)

The Board of Direction will consider the applications in this list not less than thirty days after the date of issue.



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A weekly bulletin of engineering positions open is available to members of the cooperating societies at a subscription of $3 per quarter or $10 per annum, payable in advance.

Men Available

Construction Superintendent or Assistant; Assoc. M. Am. Soc. C.E.; 38; native American; 10 years with one contractor on construction of dams, power plants, bridges, etc.; 8 years with federal government on soil erosion and drainage control; for past year with well-known concern on East coast working on naval contracts. Available immediately; will go anywhere. C-956.

Civil Engineer; Assoc. M. Am. Soc. C.E.; 33; 8 years in responsible charge of construction work, 2 years in office engineer. Experience on airfields, roads, bridges, and drainage. Can possibly furnish and supervise survey parties, draftsmen, and inspectors. C-957.

Executive Engineer; M. Am. Soc. C.E.; 45; B.S.C.E., Cornell University; native American; member of leading technical societies; over 20 years' broad construction experience in transport, utility, and industrial work. Proved ability as construction manager and job organizer on large work, both domestic and foreign; also experienced in developing new work and negotiating new contracts. At present chief engineer of well-known concern doing large amount of government work from coast to coast. C-958.

Civil Engineer; Assoc. M. Am. Soc. C.E.; 34; 12 years' experience in private practice on design and construction of water and sewerage works, including supply and treatment. Past 2 years in charge of design, specifications, and construction of utilities, including airfield grading, drainage, and paving on army air bases and cantonments. C-959.

Positions Available

Commissions. Civil Engineers for officer candidates in the U.S. Army. Must be 35–45 years of age. Must have had at least 5 years' experience, supervising the construction of highways, airposts, or dirt removal—that is, drainage, leveling, etc. Apply by letter giving complete information. Location, anywhere. W-1199.

Engineers. (*a*) Civil Draftsmen. (*b*) Civil Engineer, first-class soil analysis man, to interpret soil analyses, take charge of sampling, and design subbase for runways and highways, based on results thereof. Location, Maryland. W-1220.

Office Engineer experienced in steel and concrete design and, preferably, some piping. Knowledge of water supply desirable. Salary, $4,500–$4,800 a year. Location, Kentucky. W-1301.

Master Mechanic for a construction project. Must be able to keep construction equipment operating on job located miles from replacement parts. Should be able to speak Spanish. Salary open. Location, Central America. W-1623.

Designer and Draftsman experienced in timber design, particularly trusses, etc. Salary open. Location, Oregon. Interviews, New York, N.Y. W-1652.

Civil Engineers, not necessarily graduates, but men who have had a good ground work in the fundamentals of structures. Several types required. Men who have had some experience or training in the theory of structures, steel design, such as: buildings, bridges, reinforced concrete, stress analysis, hydraulics, sheet metals, strength of materials, architectural design and drafting, and other structural work. Prefer men who have had 3 to 5 years' experience and who are of mature age—must be over 40. Employment will be in the aeronautical industry; location, East. Positions permanent. Must be native citizen of United States or show proof of United States citizenship. If interested, send for application blank. W-1690.

Concrete Engineer. Must have had previous experience as such on a very large construction job as company hopes to pour 3,000 to 5,000 cu yd a day. Must understand perfectly control of mixes and design of mixes, and be able to coordinate entire pouring schedules. Salary, $7,500–$9,000 a year. Location, East. W-1738.

RECENT BOOKS

New books of interest to Civil Engineers donated by the publishers and filed in the Engineering Societies Library, or in the Society's Reading Room, will be found listed here. The notes regarding the books are taken from the books themselves and are edited by members of the staff of the Society or of the Library. Those books which are in the Library may be borrowed by mail by Society members for a small handling charge.

An Introductory Outline to Public Utility Regulation. By John S. Worley. University Lithoprinters, Ypsilanti (Mich.), 1941. 117 pp., $11 \times 8\frac{1}{2}$ in., paper.

The studies contained in this paper-bound volume are intended to be purely introductory to the subject and to furnish a sound understanding of the broader aspects of public utility regulation.

Concrete Manual, a Manual for the Control of Concrete Construction, 4 ed. U.S. Bureau of Reclamation, Denver (Colo.), 1942. 476 pp., illus., tables, diagrs., charts, $7\frac{1}{2} \times 4\frac{1}{2}$ in., leather, $1 (lots of 40 copies or more subject to 25% discount).

Public demand for the concrete manual since its first appearance in 1938 has been so great that four editions have been required. The present edition differs from the third edition chiefly by reason of scattered changes in text and improvements in typography and quality of illustration. A few errors have been corrected, and the text has been amplified and corrected to keep it abreast of current construction practice and technical advances.

Engineering Drawing. By L. M. Sahag. Ronald Press Company, New York, 1942. 394 pp., illus., diagrs., charts, tables, $10\frac{1}{2} \times 6\frac{1}{2}$ in., cloth, $2.75.

The aim in this text has been to offer a basic course, which will be complete and thorough as well as closely articulated with industrial standards and practice. The text is divided into three sections of increasing difficulty, fundamental requirements being taught first. A wide selection of problems is included.

Engineering Mechanics, a Text-Book for Engineering Students. By B. B. Low. Longmans, Green & Co., London, New York, Toronto, 1942. 252 pp., diagrs., charts, tables, $8\frac{1}{2} \times 5\frac{1}{2}$ in., cloth, $4.50.

This book is chiefly concerned with kinematics and dynamics, including instantaneous centers, velocity and acceleration diagrams, analysis of cams, motion of rigid bodies in two dimensions, and vibrations of various kinds. A chapter is devoted to dimensions and dynamical similarity. Although complete in itself, the book is intended as a companion volume to D. A. Low's *Applied Mechanics*.

Industrial Inspection Methods. By L. C. Michelon. Harper & Brothers, New York and London, 1942. 389 pp., illus., diagrs., charts, tables, 11×8 in., cloth, $3.50.

A course of instruction prepared for use in training junior inspectors for the War Department. The book describes the principles, construction, and uses of the various instruments for dimensional control, for testing physical properties, and for surface inspection. A chapter on the organization of inspection departments is included.

Marine Pipe Covering. By W. W. Godwin. Cornell Maritime Press, New York, 1942. 142 pp., illus., diagrs., $7\frac{1}{2} \times 5$ in., cloth, $2.

A practical manual on the materials used for insulating piping and on methods of installing them on ships. Molded, curved, and flat block and canvas coverings, and plastic cements are described. There are also chapters on covering boilers, on molded cork coverings, and on hair felt and asbestos rope.

Military and Naval Maps and Grids. By William W. Flexner and Gordon L. Walker. The Dryden Press, New York (103 Park Avenue), 1942. 96 pp., diagrs., charts, maps, $8\frac{1}{2} \times 5\frac{1}{2}$ in., paper, $1.

The general principles of the construction and use of maps for students without extensive mathematical background. The properties of five kinds of maps are built up, emphasis being upon their use in the solution of naval and military problems. Those chosen are the Gnomonic (or Great Circle), the Mercator, the Lambert Conformal Conic with two standard parallels, the Stereographic, and the American Polyconic. Only the basic mathematical properties of the maps are dealt with here, as the detailed features are treated in other elementary books.

Principles of Structural Geology, 3 ed. By C. M. Nevin. John Wiley & Sons, New York; Chapman & Hall, London, 1942. 320 pp., illus., diagrs., charts, tables, $9\frac{1}{2} \times 6$ in., cloth, $3.50.

The aim of this text for beginners is to discuss the deformations of the earth as simply as possible. The new edition has been thoroughly revised and brought up to date.

Proposed Post-War Works Program. Prepared by the New York City Planning Commission. 40 pp., illus., tables, diagrs., maps, $11 \times 8\frac{1}{2}$ in., paper, 25 cents (obtainable from the Treasurer of the City of New York—postage stamps not acceptable).

At the instigation of the mayor, the City Planning Commission has prepared a revised program, including a list of construction work that must be postponed due to war priorities. An eight-page supplement covers the projects proposed for addition to the post-war works program adopted by the city in June 1942.

Seven-Place Values of Trigonometric Functions for Every Thousandth of a Degree, compiled by Dr. J. Peters. D. Van Nostrand Co., New York, 1942. No pagination given, tables, $9\frac{1}{2} \times 7$ in., cloth, $7.50.

These tables are admirably suited for large-scale computations with calculating machines. Tables are provided for sines, cosines, tangents, and cotangents. Supplementary tables are given for converting minutes and seconds into decimal parts of degrees, and vice versa, and for converting degrees to time and time to degrees.

Short Course in Surveying. By R. E. Davis and J. W. Kelly. McGraw-Hill Book Co., New York and London, 1942. 330 pp., illus., diagrs., charts, tables, maps, $7\frac{1}{2} \times 5$ in., leather, $2.50.

This small book presents the essential principles and practice of elementary plane surveyings, in a form useful for the rapid training of rodmen, chainmen, instrumentmen, and draftsmen during the present emergency. Numerous field problems are included, as well as the necessary tables.

Steel and Timber Structures, compiled by a Staff of Specialists; 2 ed. revised and enlarged. Editors-in-Chief, G. A. Hool and W. S. Kinne; revised by R. R. Zipprodt and D. M. Griffith. McGraw-Hill Book Co., New York and London, 1942. 733 pp., illus., diagrs., charts, tables, $9\frac{1}{2} \times 6$ in., cloth, $6.

This book is one of a series of six designed to be a reference work on the design and construction of structures. It deals with steel and timber buildings, roof trusses, short-span steel bridges, timber bridges and trestles, steel tanks, and chimneys, and discusses detailing, fabricating, erecting and estimating, and materials. The treatment is thorough and detailed. This edition has been thoroughly revised and brought up to date.

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Abstracts of Articles on Civil Engineering Subjects from Publications (Except Those of the American Society of Civil Engineers) in this Country and Foreign Lands

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BRIDGES

Concrete Slab. Concrete Trestle-Bridge Construction on Missouri Pacific Railroad, R. P. Hart. *Engineering*, vol. 154, nos. 3998 and 4000, Aug. 28, 1942, pp. 161–163, (illustrations) 170, and Sept. 11, pp. 201–202. Account of whole organization and methods of operation; railway company is manufacturing piles and slab units from which trestles are built; octagonal 24-in. pre-cast concrete piles have been adopted as standard. From *Concrete for Railways*, publication of Portland Cement Assn.

Concrete, Waverly, Ohio. Ohio Changes Girder-Type Bridge Designs from Steel to Reinforced Concrete, W. S. Hindman. *Concrete*, vol. 50, no. 10, Oct. 1942, pp. 2–3. 69 tons of steel saved by changing from steel to reinforced concrete design; design and construction details are illustrated and described.

Design, Standardization. Standardization of Ferroconcrete Arched Road Bridges with Earth-Filled Spandrels, L. E. Hunter. *Structural Engr.*, vol. 20, no. 8, Aug. 1942, pp. 131–138. Study of minimum and maximum stress ratios in varying arch design in attempt to standardize spans up to 100 ft; curves show graphic results of various schemes; method, found to be successful, is to fix depth of arch rib and to vary steel reinforcement ratio; example of use of arch standardization.

Highway, Strengthening. Strengthening Old Highway Bridges, G. M. Foster. *Eng. & Contract Rev.*, vol. 55, nos. 38 and 40, Sept. 23, 1942, pp. 58–61 and 71, and Oct. 7, pp. 10–12 and 19. Discussion of usual type of structure of older bridges with view to analysis of load and its distribution affecting stresses in various members; suggested strengthening measures and methods based on survey of existing structure.

Steel. Steel Rigid-Frame Bridges, T. C. Grisenthwaite. *Structural Engr.*, vol. 20, no. 11, Nov. 1942, pp. 224–242, supp. sheets. Consideration of bridge sites in which rigid-frame bridge will serve most advantageously; comparative advantages of hinged and fixed frames; methods of design; structural details of frames; welded frame bridges.

Steel, Welded. Design of Welded Steelwork in Bridgewater Bridge, Tasmania, D. V. Isaacs. *Welding J.*, vol. 21, no. 9, Sept. 1942, pp. 601–608. Details of welded design of new Bridgewater Bridge, Tasmania; attention is confined mainly to development of new types of connections and make-ups of members for design of 157-ft 6 in. trusses forming part of bridge; particular attention is paid to importance of fatigue as affecting welded design. From *J. Instn. Engrs., Australia*, Dec. 1941.

BUILDINGS

Air-Raid Precautions, Shelters. Concrete Bomb Shelter Is Integral Part of Big Aircraft Plant, W. E. Reynolds. *Concrete*, vol. 50, no. 11, Nov. 1942, pp. 4–5 and 36. Procedure employed in construction of bomb shelter for industrial workers—50 by 1,050 ft in plan and 15 ft 4 in. high, built of reinforced concrete and steel construction—illustrated and described; shelter is built as integral part of main building.

Welded Steel Structures. Investigation Into Behavior of Welded Rigid-Frame Structures, J. F. Baker and J. W. Roderick. *Inst. Welding—Quarterly Trans.*, vol. 5, no. 3, July 1942, pp. 97–119. Third Interim Report of R.42 Subcommittee on Frame Structures, dealing with behavior of stanchions bent in single curvature; purpose of test was investigation of behavior of continuous stanchions, bent into single curvature by beams framing into them, and subjected to axial load until failure occurred. Bibliography.

Welded Steel Structures. Welded Building Construction. *Welding Engr.*, vol. 27, no. 12, Dec. 1942, pp. 43–46. Records indicate that design and erection considerations are important factors in structural steel welding costs; welders average 32 in. of $^3/_8$-in. fillet weld per hour.

CITY AND REGIONAL PLANNING

Cities and Towns, Restoration. Die Altstadterneuerung in Nuernberg, B. J. Lincke. *Zentralblatt der Bauverwaltung*, vol. 61, nos. 16–18, Apr. 23, 1941, pp. 285–298. Restoration of ancient inner wall city of Nuernberg, Germany, considered one of best preserved of larger cities of the Middle Ages; details and photographs of reconstruction of bridges, wall towers, forts, and buildings.

Expressways and Parkways. Road Layout and Traffic Control. *Engineering*, vol. 154, no. 4003, Oct. 2, 1942, pp. 271–272. Editorial discussion of book by H. A. Tripp, entitled *Town Planning and Road Traffic;* his argument is that, as main traffic artery is just as dangerous as main line railway, it should be isolated equally from indiscriminate access; it should be closed to pedestrians and cyclists and should contain no frontages; no side roads, except secondary arteries, should enter it.

Post-War. Post-War Planning, H. E. Olson. *Minn. Federation Architectural & Eng. Societies—Bul.*, vol. 27, no. 9, Sept. 1942, pp. 5–7. Civic problems discussed.

Post-War. Post-War Reconstruction and Planning. P. B. Mountford. *Instn. Mun. & County Engrs.—J.*, vol. 69, no. 4, Oct. 13, 1942, pp. 116–120, (discussion) 121–123. War damage and present position outlined. Three salient features to be dealt with in national plan: Transport, industry, and agriculture, each of which is dependent on the other, are considered.

Post-War. City of London Reconstruction, S. Bylander and H. Boddington. *Structural Engr.*, vol. 20, no. 6, June 1942, pp. 85–88. Conclusion of discussion of paper indexed in *Engineering Index*, 1941, p. 220.

CONCRETE

Bridges. Well Organized County Bridge Modernization Program, J. W. Harty. *Pub. Works*, vol. 73, no. 12, Dec. 1942, pp. 24–26 and 41. Concrete bridges and culverts are replacing several hundred structures that no longer are adequate for greatly increased traffic; systematic program that is being followed in Grand Forks County, North Dakota, is described.

Concrete Aggregates. Influence of Sands, Cements, and Manipulation Upon Resistance of Concrete to Freezing and Thawing, W. C. Hansen, *American Concrete Inst.—J.*, vol. 14, no. 2, Nov. 1942, pp. 105–123. Four sands, four cements, and one coarse aggregate were used in making concretes of four different consistencies; strengths, absorptions, and resistance to freezing and thawing were determined; study showed that influence of both sand and cement on resistance of concrete to freezing and thawing is determined by their influence on amount of mixing water required to give desired consistency and effect on bleeding characteristics.

Construction. Big Concrete Plant Speeds Power Dam. *Eng. News-Rec.*, vol. 129, no. 25, Dec. 17, 1942, pp. 854–856. To place 525,000 cu yd of concrete in 12 months for large dam, contractor installed concrete plant capable of placing maximum of 4,500 cu yd daily and of averaging 2,000 cu yd; most of concrete is placed by 4-cu yd buckets handled by two hammerhead cranes operating on 125-ft high trestle upstream from dam; extensive belt conveyor system, totaling over 3,400 ft in length, distributed aggregate and sand.

Construction. Job Problems and Practice. *American Concrete Inst.,—J.*, vol. 14, no. 2, Nov. 1942, pp. 125–140. Notes on following problems: Steel—Too Much or Too Little; Pre-stressed Steel in Reinforced Concrete, F. E. Richart; Frozen Concrete, W. Schnarr, R. B. Young, H. C. Shields, H. C. Watts, N. H. Withey, and E. A. Hagy; Effect of Vinsol Resin on Bond Between Concrete and Steel, C. E. Wuerpel; Insulating Value of Cinder-Concrete Masonry Walls; Shrinkage of Concrete Exposed to Weather, J. C. Pearson and R. F. Adams; Variation in Test Strength of Concrete and Mortar Specimens According to Moisture Content at Time of Test, F. L. Fitzpatrick; Causes and Control of Bleeding, J. C. Sprague; Mixed Brands of Cement on Same Job; Light-Weight Aggregate to Save Steel, F. E. Richart; and Method of Mix Control for Light-Weight Aggregates, H. G. Collins.

Floors. Concrete Floors on Ground Offer Business to Concrete Contractors. *Concrete*, vol. 50, no. 10, Oct. 1942, pp. 14 and 30. Federal Public Housing Authority recommends to its regional offices and to all local housing authorities that, in all publicly financed permanent war housing units, walls should be built of masonry and floors should be of plain concrete directly on ground, with fill of cinders, sand, or gravel intervening.

Mixing. Processing 250,000 Tons of Aggregates, R. S. Torgerson. *Rock Products*, vol. 45, no. 11, Nov. 1942, pp. 44–45 and 51. Union Sand and Gravel Company, Spokane, Wash., sets up system of handling sand and gravel for large defense projects; blasting gravel deposit; screening; sand specifications; dry batching of aggregates and cement.

Ready Mixed, Missouri. Radial Conveyor Supplies Aggregates to Odd Arrangement of Batching Bins. *Pit & Quarry*, vol. 35, no. 5, Nov. 1942, pp. 103–105. Notes on two plants of Hunkins-Willis Lime & Cement Company, of St. Louis, Mo., embodying several original ideas; Spring Avenue plant is near business center of St. Louis; Lindberg Avenue plant is in center of St. Louis County, 8 miles to west.

Reinforcement. Bond Strength of Reinforcing Bars Embedded Horizontally in Concrete, R. C. Robin, P. E. Olsen and R. F. Kinnane. *Instn. Engrs. Australia—J.*, vol. 14, no. 9, Sept. 1942, pp. 201–217. Results of preliminary tests made with purpose of discovering what factors influence bond of bars cast in horizontal position; most important factor found to be amount of settlement which takes place in concrete immediately after pouring; anchorage values of hooked and of deformed reinforcing bars tested.

Sand and Gravel Plants, Oregon. Poorly Graded Raw Materials Made to Yield Suitable Concrete Aggregates, W. E. Trauffer. *Pit & Quarry*, vol. 35, no. 6, Dec. 1942, pp. 46–48. Notes on plant of Pierce Island Gravel Company; deposit worked was bar at upper end of Island, 32 miles up Columbia River from Portland, Ore.; when dry material was practically exhausted, clamshell digger dredge was used; later, dredge was moved 26 miles upstream, to point where there is excess of sand; screening, storage, and handling of material, etc.

Vermiculite, North Carolina. Development of Light Weight Concretes from North Carolina Vermiculites, W. A. Scholes, A. F. Greaves-Walker, E. R. Todd and D. F. Cox. *North Carolina State College Agric. & Eng.—Eng. Experiment Station—Bul., No. 24,* May 1942, 69 pp. Origin, occurrence, production, processing, and uses of North Carolina vermiculites; factors affecting expansibility of North Carolina vermiculites; mineralogical classification; investigation of vermiculite concretes.

DAMS

Construction, Belt Conveyors. Belt Delivers Fill for Earth Dam. *Eng. News-Rec.*, vol. 129, no. 23, Dec. 3, 1942, pp. 777–780. In building 184-ft high earth dam to aid in protecting Pittsburgh from floods, 325 ft of belt conveyor is used; conveyor system transports random fill and crushed rock from crushing plant to one end of dam, from where material is distributed with carrying scrapers; also of special interest are design details of 1,800-ft partially concrete-lined spillway.

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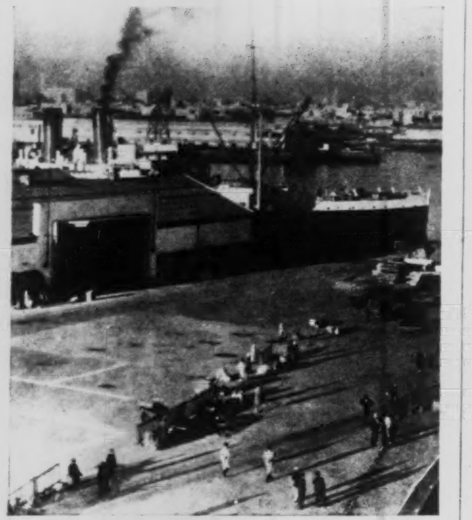

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WORLD'S LARGEST WATER DEVELOPERS

Construction. Rolled-Fill Dam Job, F. H. Spencer. *Excavating Engr.*, vol. 36, no. 11, Nov. 1942, pp. 554–557 and 572. Contracting combine tackles 10,000,000-yd rolled-fill dam job that will bring flood control, power, and irrigation advantages to citizens of Western states; constructional details.

Earth, Failure. Analysis of Failure of Earth Dam During Construction, L. F. Cooling and H. Q. Golder. *Instn. Civ. Engrs.—J.*, vol. 19, no. 1, Nov. 1942, pp. 38–55. Method of calculating stability of earth bank by so-called Swedish Method; analysis of failure of $3^1/_2$-mile dam with puddle core erected to form storage reservoir in Essex, England; description of failure; soil sampling and soil tests; detailed examination of foundation layer after stripping bank.

FLOOD CONTROL

Olean, N.Y. Review of Olean Flood in Relation to Mutual Air and Civilian Protection Programs, A. D. Drake and F. O'B. Nehin. *Am. Water Works Assn.—J.*, vol. 34, no. 12, Dec. 1942, pp. 1743–1754. Extent of flood damage; failure of dikes; mobilization of civilian protection forces; assistance by neighboring communities; health and first-aid measures; operation of water works; water system emergencies; special notice to water consumers; protection of water quality; mutual aid assistance; inadequacy of valve location system; future plans for mutual aid procedure; proper use of personnel insignia; other emergency measures; conclusions.

FOUNDATIONS

Bridge Piers. Pile Tests Point to Limitations of Current Specifications for Bearing Power, R. Owen. *Am. Ry. Eng. Assn.—Bul.*, vol. 44, no. 433, Sept.-Oct. 1942, pp. 121–124, 5 supp. sheets. Plans for control of river floods, providing for floodway 5 miles wide to divert waters from river at flood stage, required construction of bridges and trestles $3^1/_2$ miles long on highway and railroads crossing floodway; construction of high-level crossings authorized; investigations and tests were made to determine type of bridge; criticism of current specification for distribution of pile load.

Soils, Erosion. Soil Erosion Control Practices That Meet Wartime Needs, R. C. Hay. *Agric. Eng.*, vol. 23, no. 11, Nov. 1942, pp. 353–355. Practices and recommendations for soil-erosion control. Bibliography. Before Am. Soc. Agric. Engrs.

Soils, Stabilization. Pressure-Grouting with Cement-Loam Mixture Restores Settled Buildings. *Concrete*, vol. 50, no. 11, Nov. 1942, pp. 2–3. Settlement of existing buildings occurred in large residential sections in St. Louis as aftermath of drought years of middle 1940's; success experienced with pressure grouting operations for correcting settlement in existing buildings quite logically suggested application of same principle to stabilization of similar foundation soils prior to construction of new buildings; method of procedure described and illustrated.

LAND RECLAMATION AND DRAINAGE

Airports, Florida. Constructing Airport on Florida Sands, C. H. Moneypenny. *Pub. Works*, vol. 73, no. 12, Dec. 1942, pp. 11–13. Sandy soil offered poor foundation for asphalt runway surfaces, and was conditioned by mixing local marl into it 3 in. deep; drainage required 8 miles of pipe and $^1/_2$ mile of canal; manner in which work was carried out.

Great Britain. East Newport Main Drainage Scheme, C. Cobbett. *Instn. Mun. & County Engrs.—J.*, vol. 69, no. 4, Oct. 13, 1942, pp. 124–130. As result of serious and repeated flooding in several areas in town, County Borough Council decided to construct storm overflow chamber; details of construction illustrated and described.

Reservoirs, Timber Clearance. Clearing Santee-Cooper. *Power Plant Eng.*, vol. 46, no. 9, Sept. 1942, pp. 78–81. Details and photographs of greatest clearing project ever undertaken in United States; as preparatory to work on this hydroelectric and navigation development, huge clearing operation has prepared more than 103,000 acres of swamp and forest land for basins that form twin reservoirs of power project.

MATERIALS TESTING

Concrete. Measuring Length of Drilled Core Specimens, L. W. Teller. *Concrete*, vol. 50, no. 10, Oct. 1942, pp. 33–35. Results of study indicated that: Direct calipering of core lengths is method of measurement preferred by most agencies; accuracy of length determination of 0.05 in. is reasonably satisfactory, etc. From Report of Committee C-9 on Concrete and Concrete Aggregates before Am. Soc. Testing Matls.

Road Materials. Tests for Road Tars. *Roads & Road Construction*, vol. 20, no. 238, Oct. 1, 1942, pp. 228–230. Investigation into laboratory performance tests; behavior of road tars; viscosity value; weathering of tars; weathering tests; full-scale road tests; thin carpets manufactured with various experimental tars; durability tests; proposed new specification for road tars. Extracts from report, *Performance Tests for Road Tars*, before joint meeting Soc. Chem. Industry and Instn. Mun. & Country Engrs., London.

Welds, Stresses. Estimation of Distribution of Shear Stress in Spot Welds, R. F. Tylecote. *Inst. Welding—Quarterly Trans.*, vol. 5, no. 3, July 1942, pp. 143–144. Report of investigation shows that drilling out of some of material from center of spot reduces failing load of spot weld, however small hole may be; therefore, it must be assumed that at failure material in center of weld is playing useful part; this means that stress distribution probably varies according to load applied.

ROADS AND STREETS

Accident Prevention. Kentucky Paves Way, T. B. Smith. *Nat. Safety News*, vol. 46, no. 5, Nov. 1942, pp. 20–21 and 102–105. Safety methods used by Kentucky Dept. of Highways in highway construction work.

Airports, Snow Removal. Wartime Experience in Runway Clearance, T. Roberts. *Roads & Bridges*, vol. 80, no. 10, Oct. 1942, pp. 29–32, 66, 68, and 70. Technique now well stabilized in winter maintenance of airports, both for commercial work and for R.C.A.F. training, is combination of dragging and rolling methods; diagram showing sequence of operations in maintenance of snow-covered airport surfaces as established by Air Services Branch of Dept. of Transport, Canada.

Airports, Snow Removal. Winter-Maintenance Methods for R.C.A.F. Airfields. *Roads & Bridges*, vol. 80, no. 10, Oct. 1942, pp. 33–35, 100, 102, and 104. Article is based on official instructions relative to winter maintenance of air fields; recommended equipment and procedure given.

Culverts, Debris Control. Debris Control at Culvert Entrances on California State Highway System, G. A. Tilton, Jr., and C. F. Woodin. *Calif. Highways & Pub. Works*, vol. 20, no. 10, Oct. 1942, pp. 5–9 and 15. Definition and classification of debris and control measures, recommending that greater attention be given this problem at time of preliminary surveys of culvert locations.

Drainage. We Build to Reduce Upkeep, W. J. Warren. *Better Roads*, vol. 12, no. 11, Nov. 1942, pp. 25–26 and 36. Van Zandt County, Texas, follows practice of extending improved surfaces only after providing good roadbeds and good drainage.

Frost Effect. Inexpensive Treatment for Frost Boils Helps Prevent Costly Pavement Repairs. *Eng. & Contract. Rec.*, vol. 55, no. 42, Oct. 21, 1942, p. 33. Digging out frost boils in bituminous pavements and filling hole with salt or calcium chloride has been found to prevent further heaving and preserve pavement from deterioration during spring thaws.

Highway Engineering, Wartime. Roads Under War Restrictions—II. *Eng. News-Rec.*, vol. 129, no. 17, Oct. 22, 1942, pp. 555–557. Survey of conditions and operations of highway departments in Wyoming, Minnesota, and Nebraska, where shortage of road oil is major problem.

Highway Engineering, Wartime. Roads Under Restrictions—III. *Eng. News.-Rec.*, vol. 129, no. 19, Nov. 5, 1942, pp. 627–630. Problems encountered by state highway engineers due to war restrictions; manner in which Iowa, Colorado, and Utah, are meeting today's conditions is reported from interviews with heads of highway department.

Highway Systems, Canada. Completion of Ontario Section, Trans-Canada Highway. *Roads & Bridges*, vol. 80, no. 10, Oct. 1942, pp. 45–46 and 114. Review of salient features of work in connection with construction of Geraldton-Hearst section of Trans-Canada Highway in Northern Ontario.

Highway Systems, Michigan. Roads of Willow Run, G. D. Kennedy. *Better Roads*, vol. 12, no. 11, Nov. 1942, pp. 13–16. Michigan State Highway Department drew on all available resources to expedite road system serving Willow Run bomber plant; description of highway system; manner in which work was done.

Highway Systems, Oregon. Wolf Creek and Wilson River Highways, Oregon. *Pub. Works*, vol. 73, no. 11, Nov. 1942, pp. 13–14. Two routes through rugged mountain country reduce by nearly 50% highway distance from Portland to Coast; roads are only 65% completed; manner in which work was accomplished; on constructed portions of both highways maximum grade is 6%; curvature is 6° on Wolf Creek and 10% on Wilson River Highway, but temporarily slightly sharper curvature exists on each at certain points due to emergency conditions.

Highway Systems, United States. Designing Highways for Peace and for Defense, C. W. Wild. *Landscape Architecture*, vol. 32, no. 4, July 1942, pp. 136–139. Brief discussion of problems arising in connection with design and construction of highways; problems of by-passing and elimination of bottlenecks; dual roadway designs best answer to destruction from air; highway location should allow trucks to scatter off open roads and be concealed by nearby plantings or protective covering.

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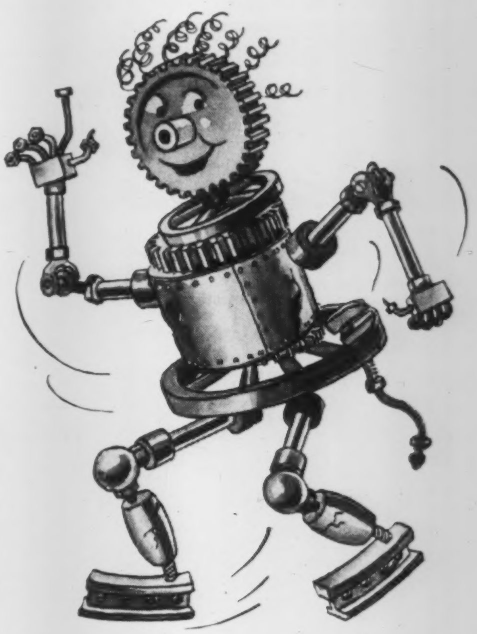

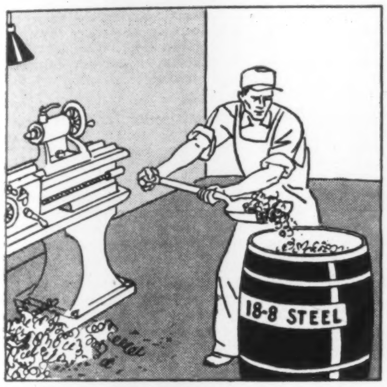

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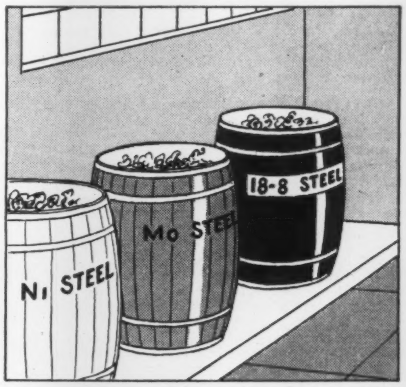
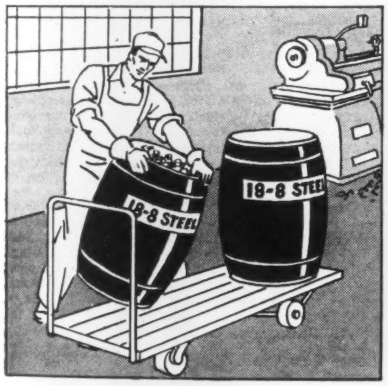
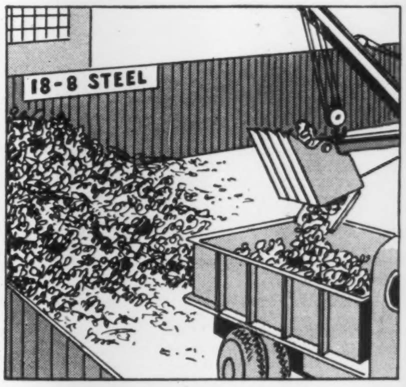


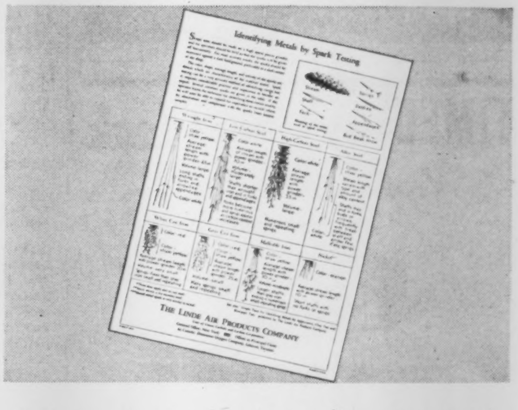
2. Place the scrap in containers correctly labeled with the known analysis of the steel or its grade number.



3. Maintain a system of replacement when containers are full. Label replacements to compare with filled containers.



4. Keep the alloy metals segregated in the scrapyard while they are waiting shipment back to the steel mill.



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5. If scrap does become mixed, or if you have metal, such as old equipment, of unknown analysis, you will find spark testing is helpful in identifying the alloy content. The Linde Air Products Company, another unit of Union Carbide and Carbon Corporation, has published the spark-testing chart shown here. If you can use it, ask for as many copies as you want, by Form Number 4666.

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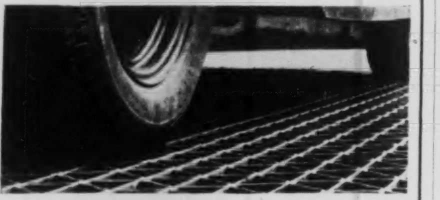

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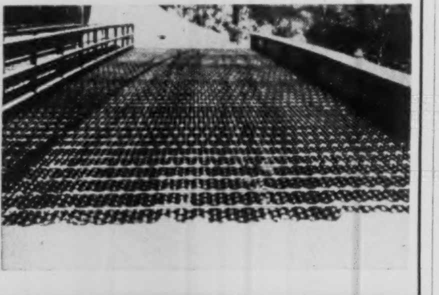

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MAINTENANCE AND REPAIR. Is Highway Maintenance Essential? M. A. Lyons. *Eng. & Contract. Rec.*, vol. 55, no. 46, Nov. 18, 1942, pp. 20–21 and 26–27. Importance of highway maintenance to Canadian war effort; Federal regulations; tires and gasoline; bridge repairs; Manitoba's policy; winter road problems. Before Interprovincial Conference of Canadian Good Roads Assn., Montebello, Quebec.

MICHIGAN. Michigan Test Road. *Mich. State Highway Dept.—Special Bul.*, 1942, 67 pp., $1.50. Summary of essential features of design and construction pertinent to Michigan Test Road; included in this summary are all of important factual data relevant to project—such as location, description, purpose, and scope of study, descriptive outline of test sections, and detail layout of design and durability studies.

ROADSIDE IMPROVEMENT. Cotton Fabric for Erosion Control, W. B. King. *Pub. Roads*, vol. 23, no. 5, July-Aug.-Sept. 1942, pp. 94–96. Cotton fabric was used experimentally for erosion control on roadside slopes and ditches on eight test sections in Mississippi during summer and fall of 1940; fabric used was of following types: S1-54, S1-40, S2-54, and S2-40, latter figure in each designation being width of fabric in inches; approximately equal amounts of each type of fabric were used, 15,948 sq yd being used in eight test sections; both types of cotton fabric have relatively large mesh openings; report of experiments.

SNOW AND ICE CONTROL. Modern Practice in Ice Control. *Eng. & Contract. Rec.*, vol. 55, no. 42, Oct. 21, 1942, pp. 28–31. Effective skidproofing of highways is prerequisite for safe winter driving; relative efficiencies of abrasives, value of chemical treatments, and latest application techniques are reviewed.

SNOW AND ICE CONTROL. Snow in Relation to Highway Location and Design, W. H. Harvie. *Roads & Bridges*, vol. 80, no. 10, Oct. 1942, pp. 123, 127, and 130–131. Design of modern highway system to assist maintenance division in snow problem; article discusses classification, location, right-of-way width, high type roads, grade line, and cross section. Before Central Snow Conference sponsored by Mich. State College.

SEWERAGE AND SEWAGE DISPOSAL

BIOFILTRATION PROCESS. Present Status of Biofiltration, A. J. Fischer. *Water Works & Sewerage*, vol. 89, no. 10, Oct. 1942, pp. 416–425. At present time there are 150 biofiltration plants in operation or under construction in United States; design factors; operating data; power requirements; future outlook.

CLEVELAND. Sewerage Development in Cleveland, W. L. Havens. *Am. City*, vol. 57, no. 10, Oct. 1942, pp. 42–44. Illustrated description of design, equipment, and operation of three plants.

DISPOSAL PLANTS. Modern Practice in Sewerage Plant Operation, N. J. Howard. *Eng. & Contract. Rec.*, vol. 55, no. 45, Oct. 28, 1942, pp. 26–27 and 40. Review of basic principles of sewage treatment; pre-treatment analysis; operating problems; effluent disinfection.

DISPOSAL PLANTS, OPERATION. Operation of Sewage Treatment Plants. *Pub. Works*, vol. 73, no. 10, Oct. 1942, pp. 12–13 and 26 pages between pp. 25 and 68. Real job of sewage plant operator; methods and units of measurement; sewage characteristics and composition; tests and how to make them; operating grit chambers, and coarse screens; mechanically cleaned sedimentation tanks; activated sludge; Imhoff tanks; trickling filter operation; contact beds and sand filters; chemical treatment; disinfection of sewage; sludge digestion tanks; disposal of sludge; maintenance of equipment; other factors.

DISPOSAL PLANTS, POST-WAR. Planning Sewage Works for Post-War Construction, S. G. Hess. *Sewage Works Eng. & Mun. Sanitation*, vol. 13, no. 10, Oct. 1942, pp. 503–506 and 530. Interstate Sanitation Commission controls efficiency of present plants and requires plans for future construction; financial programming essential; regional agencies must educate; pollution inspections by officials; sludge removal by plants; present plants unaffected by war; submarine menace affects sludge barging; standards must be maintained.

DISPOSAL PLANTS, WAR TIME. War Damage to Sewerage Systems, E. Devendorf and A. F. Dappert. *Sewage Works Eng. & Mun. Sanitation*, vol. 13, no. 10, Oct. 1942, pp. 497–502 and 531–532. Damages which may result to sewer systems and sewage treatment works from bombing or sabotage may be extensive and produce great discomfort and confusion in community through disruption of sewer service; Mutual Aid Plan for Water Service in New York State discussed; objectives of plan; protection against possible sabotage; integration of local sewer department in local civilian protection organization; training program for sewerage works auxiliaries.

DISPOSAL PLANTS, WARTIME. Wartime Problems in Sewage Treatment. *Sewage Works Eng. & Mun. Sanitation*, vol. 13, no. 10, Oct. 1942, pp. 515–518. Symposium of following articles: California City Prepares for War Damage, U. H. Erickson; War Emergency Repairs Keep Pumps in Service, W. P. Gyatt; Even Resort Town Has War Problems, H. J. Spragg.

DISPOSAL PLANTS, WINNIPEG. Sewage Odor Control at Winnipeg, D. L. McLean and G. C. Laidlaw. *Eng. & Contract. Rec.*, vol. 55, no. 43, Oct. 28, 1942, pp. 32–35. General description of Greater Winnipeg Sanitary District Sewage Treatment Works; summary of operation data.

PIPE, CONCRETE. Industrial Progress Follows Sewerage, G. W. Hoffmann. *Rock Products*, vol. 45, no. 10, Oct. 1942, pp. 90–91. American and European-made concrete-pipe machinery have contributed much to sanitation and development of Latin-Americas since last war.

SEWAGE FILTERS, TRICKLING. Development of Trickling Filters for Royal Canadian Air Force, G. G. Reid. *Eng. & Contract. Rec.*, vol. 55, no. 45, Nov. 11, 1942, pp. 18–19. Notes on trickling filters at present in course of construction for Royal Canadian Air Force; author has adopted design for R.C.A.F. which combines merits of both bio-filter and aero-filter to some extent, and which is capable of having its efficiency increased by addition of forced draft air or by regulation within certain limits of recirculation flow involved. Before Can. Inst. Sewage & Sanitation Convention.

SEWERS, DESIGN. Conservation of War Materials in Sewerage Design, C. R. Velzy. *Sewage Works Eng. & Mun. Sanitation*, vol. 13, no. 10, Oct. 1942, pp. 509–511. Review of methods for conserving war materials indicates some of things that can be done in sewerage design; many materials on restricted list; steel saved in structural design; reduction in copper requirements; substitutes for metals; wood good for corrosive wastes.

SLUDGE. Sludge Conditioning and Dewatering at Chicago Southwest, R. C. Hageman. *Sewage Works Eng. & Mun. Sanitation*, vol. 13, no. 9, Sept. 1942, pp. 442–445. Ferric chloride conditioning and vacuum filtration used at Chicago's southwest sewage treatment plant; description of ferric chloride unloading and storage, dosing equipment, vacuum filters, vacuum pumps, vacuum receivers and moisture traps, filtrate pumps, and filter cake conveyors.

SLUDGE DIGESTION. Sludge Digestion, W. E. Gerdel. *Water Works & Sewerage*, vol. 89, no. 10, Oct. 1942, pp. 409–415. Design studies, observations, and developments at Westerly Sewage Treatment Plant, Cleveland, Ohio.

UNITED STATES. Sewage Treatment to Meet War Needs. *Eng. News-Rec.*, vol. 129, no. 19, Nov. 5, 1942, pp. 633–635. Outline of some of major problems and suggested solutions; discussion of limited operation experience with war projects to provide basis for design; uncertainty as to future use of project and load on treatment plant; great shortage of many materials; difficulty of securing and organizing adequate, qualified operating personnel.

STRUCTURAL ENGINEERING

FLOORS, WOODEN. Timber in Building Construction—Pt. I—Floors. *Brit. Standards Instn.*—Brit. Standard, no. 1018—Pt. I—1942, 12 pp. Standard deals with floors of ordinary board and joist construction; definitions; timber; working stresses; moisture content; drying; floor loadings and members; lateral restraint of beams; floor boards; fastening; loads on binders; method for determination of moisture content.

FRAMED STRUCTURES, WELDED STEEL. Welded Frames Cut Cost and Save Steel, F. W. Mettler. *Eng. News-Rec.*, vol. 129, no. 21, Nov. 19, 1942, pp. 700–701. Typical one-story industrial plant of welded, rigid-frame construction, with wood purlins, used as example to compare cost and steel saving advantages of this type of design over that of conventional truss construction for similar building with same floor area.

ROOF TRUSSES. Timber Trusses with Steel Diagonals. *Eng. News-Rec.*, vol. 129, no. 17, Oct. 22, 1942, p. 589. Steel diagonals in 99-ft span timber trusses are used to permit passage of maximum amount of natural light in aircraft plant of sawtooth roof construction.

STRUCTURAL STEEL, CONSERVATION. Amounts of Steel Required for Steel Mill Buildings. *Eng. News-Rec.*, vol. 129, no. 21, Nov. 19, 1942, pp. 722–728. Report of study made by Specifications Branch, Conservation Division, War Production Board to determine those types of roof construction whose use involves least amounts of steel in overall design of steel mill buildings; fourteen types of roof were studied in connection with three different spans of roof trusses.

WALLS, MASONRY. Relative Value of Masonry Wall Types in Ability to Resist Rain. *Concrete* vol. 50, no. 9, Sept. 1942, pp. 18 and 28. In order to evaluate important elements of masonry wall construction, Development Department of Portland Cement Assn. undertook comprehensive investigation of factors involved; more than 200 permeability tests were made on 101 wallettes, 32 in. wide, 48 in. high, and with 4-in., 8-in. and 12-in. thicknesses; results shown on drawing

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WELDS, STRESSES. Controlling Effect of Contraction and Included Stresses in Welded Structures, A. E. Berriman. *Welding J.*, vol. 21, no. 6, June 1942, pp. 373–378. Nature of contraction and included stresses discussed, showing what happens during and after welding; ten rules, which are considered guide for high standard of perfection in welded construction, are formulated; rules will control effect of contraction and included stresses. Bibliography.

TRAFFIC CONTROL

HIGHWAY TRAFFIC SIGNS, SIGNALS, AND MARKINGS. Night-Time Visibility of Surface-Dressed Traffic Lines. *Pub. Works*, vol. 73, no. 10, Oct. 1942, pp. 22 and 24. Under blackout conditions ordinary white painted traffic line is not nearly so visible as one in which light-colored stone chips have been embedded; Road Research Laboratory in Great Britain, with cooperation of Ministry of War Transport, has been studying production of white traffic lines by use of white or light colored stone chips held to road surface by tar or asphalt; results of findings to date.

TUNNELS

AIR-RAID PRECAUTIONS, SHELTERS. Tunneling for Deep Shelters, R. W. Grant. *Instn. Mun. & County Engrs.—J.*, vol. 69, no. 2, Aug. 18, 1942, pp. 41–51; (discussion) 51–53. Detailed discussion of experience in tunneling for deep shelters in City and County of Newcastle-upon-Tyne.

CONSTRUCTION. Driving Small Pioneer Tunnel. *Western Construction News*, vol. 17, no. 8, Aug. 1942, pp. 345–347. Details of work in driving 7 by 7-ft pioneer drift on Loveland Pass highway being reconstructed by Colorado Highway Dept. 682 ft below present summit of elevation 11,992; specialized tunnel equipment developed.

CONSTRUCTION, GEOLOGY. Geology in Relation to Tunnel Work, R. Hammond. *Civ. Eng.* (London), vol. 37, no. 435, Sept. 1942, pp. 182–185. By use of diamond drilling and electrical prospecting, now applied on large scale for gold prospecting in conjunction with air survey, it should be possible to form clearer idea of rock structure than was formerly the case; Simplon and Galo Tara tunnels given as examples of unknown dangers that may be met with on large tunnel works; example of what may occur in unsound rock is exemplified by concrete-lined pressure tunnel supplying water to city of Sidney.

VEHICULAR, LINING. Timber-Lined Highway Tunnel, A. V. Benedict. *Western Construction News*, vol. 17, no. 7, July 1942, pp. 299–302. Stage construction plans of Oregon Highway Commission call for ultimate concrete lining of 779 ft; sunset tunnel now in use with treated-fir timber lining supported on concrete sills.

WATER PIPE LINES

CHLORINATION. Maintaining Open Diffuser Plates with Chlorine, R. B. Jackson. *Water Works & Sewerage*, vol. 89, no. 9, Sept. 1942, pp. 380–382. Experience of 2 years at Jackson, Mich., activated-sludge plant: Plate clogging and relief measures; chlorine was added to air supply going to aeration tanks; cylinder of chlorine was placed on platform scale and amount of chlorine gas added to air header direct was determined by decreasing weight of chlorine and container; ratio of chlorine gas to air input and effects; routine practice established; no ill effects noted.

CORROSION. Role of Bacteria in Corrosion and Adaptation of Chlorination in Control of Interior Corrosion of Pipe Lines, A. H. Thomas. *Water Works & Sewerage*, vol. 89, no. 9, Sept. 1942, pp. 367–372. Some forms of bacteria, chiefly of anaerobic types, have much to do with corrosion of iron and steel in natural, underwater and undersoil environments; nature of corrosion bacteria; observations in field; laboratory studies; methods of controlling corrosion bacteria; efficacy of chlorine convincingly demonstrated. Bibliography. Before Engrs. Soc., Western, Pa.

MAINTENANCE AND REPAIR. Emergency Repair of Distribution Systems W. V. Weir. *Water Works & Sewerage* vol. 89, no. 8, Aug. 1942, pp. 349–351. Suggested method for properly handling emergency distribution system repairs in least possible length of time. Before Am. Water Works Assn.

MAINTENANCE AND REPAIR. Methods of Handling Street Excavations, D. D. Gross. *Am. Water Works Assn.—J.*, vol. 34, no. 10, Oct. 1942, pp. 1545–1551. Discussion of methods of handling street excavations confined largely to problems that arise after water main, or other structure, has been installed and excavation is backfilled.

WATER RESOURCES

WATER SUPPLY, CALIFORNIA. Water Supply for East Bay Cities, J. S. Longwell. *Western City*, vol. 18, no. 10, Oct. 1942, pp. 22–25. Within East Bay Municipal Utility District Boundaries, water is furnished to nine incorporated cities, as well as to large adjacent unincorporated area; surplus waters are being furnished to number of Army camps, Naval bases, and training centers, and to several large industries engaged in war effort; growth of District; water supply sources; protecting supply; distribution details; emergency protection; watershed lands; fire protection.

WATER TREATMENT

Bacteriology. Instruction in Water Bacteriology at Massachusetts Decontamination School, J. A. McCarthy. *New England Water Works Assn.—J.*, vol. 56, no. 3, Sept. 1942, pp. 288–293. Study of methods of collecting representative bacterial samples and explanation of preparation of satisfactory sampling bottles in emergency; possibilities of contamination of water supplies by enemy action, storms, and accidents; effectiveness of chlorine treatment; laboratory work following standard methods for examination of water, and emergency method for presumptive test of coliform bacteria.

Chicago. Water Purification in Chicago, W. W. DeBerard. *Water & Water Eng.*, vol. 45, no. 558, Nov. 1942, pp. 194–196. Chlorination started; experimental filtration plant; odor removal; chlorination experiments; design based on experiments. From *Taste & Odor Control J* (date not specified).

Chlorination. Portable Emergency Chlorinator, A. A. Bailey. *Water Works & Sewerage*, vol. 89, no. 8, Aug. 1942, pp. 347–348. In order to have stand-by equipment for chlorination of broken water mains following possible air raids during present emergency, device for purpose was designed and built at Montebello Filters, Baltimore, Md.; outfit consists of hard rubber ejector which was machined from $1^{5}/_{8}$-in. rubber bar, two 10-ft lengths of 1-in. rubber hose, 6 ft of $^{1}/_{4}$-in. copper tubing for chlorine supply, and solution tube; detailed description of apparatus.

Filtration Plants. Pressure Filtration Practice. *Water & Water Eng.*, vol. 45, no. 557, Oct. 1942, pp. 129–138. Experience in practical running of press filtration works; source of supplies and nature of raw water; effect of storage; layout; chemical dosing and construction; treatment with alkali before and after filtration; filter design; chlorination; records; chemical testing. Before Instn. Water Engrs.

Problems and Methods. Treatment of Water for Domestic and Industrial Requirements: Some Problems and Methods, A. Parker. *Instn. Civ. Engrs.—J.*, vol. 18, no. 8, Oct. 1942, pp. 365–385, (discussion) 385–407. Brief review of problems and methods; quantities of water available and required; need for comprehensive survey; prevention of pollution; removal of suspended and colloidal matter; algae growths, filtration, disinfection, and sterilization; iron and manganese; softening; corrosive waters; iodine and fluorine.

Sodium Hexametaphosphate. Sodium Hexametaphosphate Tested for Corrosion Control, R. Eliassen and R. J. Sutherland. *Water Works Eng.*, vol. 95, no. 20, Oct. 7, 1942, pp. 1202–1205. Facts found at New York University, using city water, both plain and buffered, with various chemical doses.

Treatment Plants, Lansing, Mich. Water Conditioning at Lansing, N. N. Wolpert. *Water Works Eng.*, vol. 95, no. 19, Sept. 23, 1942, pp. 1142–1145 and 1163. Operating results obtained at new water-conditioning plant at Lansing, Mich.; it is believed that plant will show saving to customers of $150,000 yearly; description of treatment processes followed.

Water Works, Virginia. Strategy and Tactics on Wartime Waterworks Project, E. J. Cleary. *Eng. News-Rec.*, vol. 129, no. 15, Oct. 8, 1942, pp. 474–478. Outline of unorthodox procedures which were carried out in order to supply urgently needed water to Norfolk, Newport News, and Portsmouth, Va.; development of new sources of supply and construction of enlarged treatment and distribution facilities accomplished in few months.

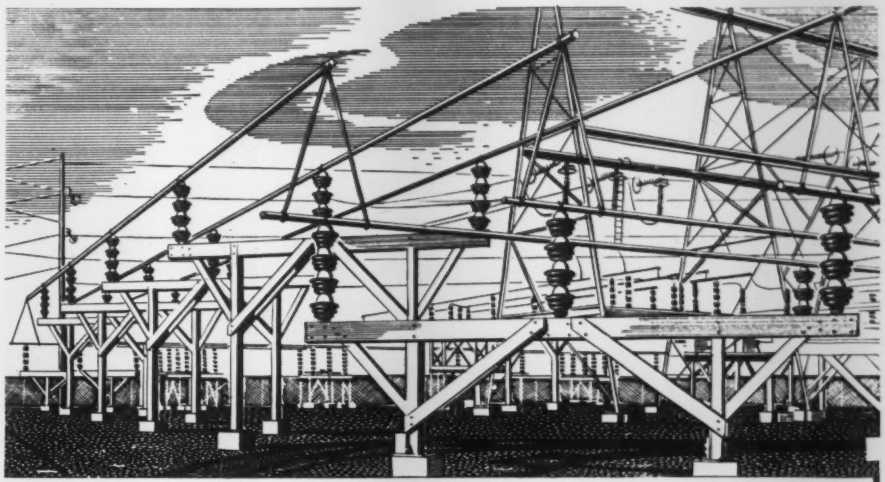
WATER WORKS ENGINEERING

Algae Control. How to Handle Algae Problem. A. E. Berry. *Water & Sewage*, vol. 80, no. 9, Sept. 1942, pp. 17–20 and 38–39. Discussion of problems which algae create; taste in drinking water and control of growths; application of copper sulfate; characteristics of algae nuisances; control measures recommended.

Analysis. Water for Process Industries, H. A. Leverin. *Can. Chem. & Process Industries*, vol. 26, no. 9, Sept. 1942, pp. 522–523 and 534. Report of results of investigations of industrial waters of Canada; supplementary information on methods of analyses, impurities in natural waters, and effects of certain impurities upon some industrial processes. Brief review taken from book, "Industrial Waters of Canada," published by Bureau of Mines, Ottawa.

Delaware Supply. History of Delaware Supply, C. M. Clark. *Water Works Eng.*, vol. 95, no. 21, Oct. 21, 1942, pp. 1276–1277. Although major portion of development has been completed, war postpones final construction work.

Fire Service. Leeds Static Water Supplies, W. Sleight. *Surveyor*, vol. 101, no. 2646, Oct. 9, 1942, pp. 345–347. Details of construction and



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design of various basins and tanks to act as storage reservoirs to provide adequate water supply for fire fighting; basins have capacity of over 33,000 gal and tanks from 5,000 to 22,000 gal.

New York. Development of Catskill Supply, C. M. Clark. *Water Works Eng.*, vol. 95, no. 21, Oct. 21, 1942, pp. 1268–1269 and 1292–1293. Board of Water Supply created in 1905 to find best sources of added supply; first stage of Catskill system completed 25 years ago.

Pollution. Protection of Water Supplies During Emergencies, W. L. Mallmann. *Water Works & Sewerage*, vol. 89, no. 8, Aug. 1942, pp. 361–362. Paper is presented largely to acquaint water and sewage plant operators with some principles of disinfection that must be considered in emergency water disinfection, where fresh sewage has contaminated water supply; difficulty of complete disinfection of sewage; on basis of facts given, procedure is suggested for handling of water that may have received fresh sewage pollution. Bibliography.

Protection. Maintenance of Water Supply Under War Conditions. *Water & Water Eng.*, vol. 45, no. 558, Nov. 1942, pp. 171–180. Effect of aerial attack on water works; repairs to mains and other works; remedial measures and protection of works; rationing of supplies; alternative sources of supply; emergency distribution of water; supplies of fire fighting; water works ARP control; relations with consumers. Before Instn. Water Engrs.

Softening. High-Speed Water Softening Process Makes Its Municipal Debut, A. Van Praag, Jr. *Eng. News-Rec.*, vol. 129, no. 13, Sept. 24, 1942, pp. 442–444. New type cold-line process water-softening plant installed at Teutopolis, Ill.; lime treatment is accomplished with 5–10 min. detention period by means of catalytic precipitations; not only does process give fast action, with resulting economies in size of plant, but end product is granular substance quite unlike sludge normally produced by lime treatment.

Tanks and Towers, Maintenance and Repair. Good and Bad Practices in Tank Maintenance, W. B. Davis. *Water Works & Sewerage*, vol. 89, no. 10, Oct. 1942, pp. 438–440. Good and bad practices in maintenance of elevated water tanks; characteristics of rivets that should be better understood; plate pits and correctives; longevity of water tanks; remedies for leaking tanks; need for standard specifications covering cleaning and painting; frequency of renovation and selection of contractor.

Tanks and Towers, Wood Stave. Horizontal Stave Wood Tank, H. R. Powell. *Pacific Bldr. & Engr.*, vol. 48, no. 10, Oct. 1942, pp. 22–23. Design for 212,000-gal reservoir in which timber is used to carry hydrostatic load; tank using standard 2-by-6 tongue and groove lumber dressed to 1⅝-in. thickness, was built.

War Problems. Water—Critical War Material, A. E. Gorman. *Water Works & Sewerage*, vol., 89, no. 10, Oct. 1942, pp. 431–432. Author presents viewpoint of War Production Board relative to war-time water problems that appear to lie ahead; ways by which water works officials can cooperate with federal government to aid in solving these problems suggested. Before Am. Water Works Assn.

War Time. Training for War Emergencies, H. J. Cook. *Water Works Eng.*, vol. 95, no. 18, Sept. 9, 1942, pp. 1061–1062. Water Dept. of Auburn, Me., organizes men and women in community for service should bombs damage mains; survey made of available supplies; cooperation of plumbers obtained; experienced men placed in charge; plans made to feed workers; key homes used as centers.

Water Distribution Systems, New York City. Distribution System for New York, T. Hochlerner. *Water Works Eng.*, vol. 95, no. 21, Oct. 21, 1942, pp. 1262–1267. How present extensive system developed from 1842 to serve expanding city area; Croton water served old city; Queens supplied by wells; distribution lines are coordinated, distribution from aqueducts; new tunnels made possible; pressure regulating valves installed; how Brooklyn and Queens are served; regulating valves are used; distribution reservoirs; chlorinators for open supplies; early water plans; etc.

Water Distribution Systems, San Francisco. Distribution Practices in San Francisco, Calif., G. W. Pracy. *Water Works Eng.*, vol. 95, no. 20, Oct. 7, 1942, pp. 1199–1201. Consumers are served by five principal pressure zones, present highest supply being at 800 ft; gate books checked frequently; cover provided for mains; minimum pressure is 30 lb; service and meter installations; fee paid for meter test; equipment; leak detectors found useful; emergency operation; maps and records; mechanical maintenance; shops make some fittings.

Water Wells. Installation of New Gallery in Elkhart, Indiana, C. L. Link. *Pub. Works*, vol. 73, no. 12, Dec. 1942, pp. 14–15 and 41. Wooden gallery built in 1884 needed frequent expensive repairs and was replaced with one of 18-in porous pipe, which greatly increased yield; details of installation.

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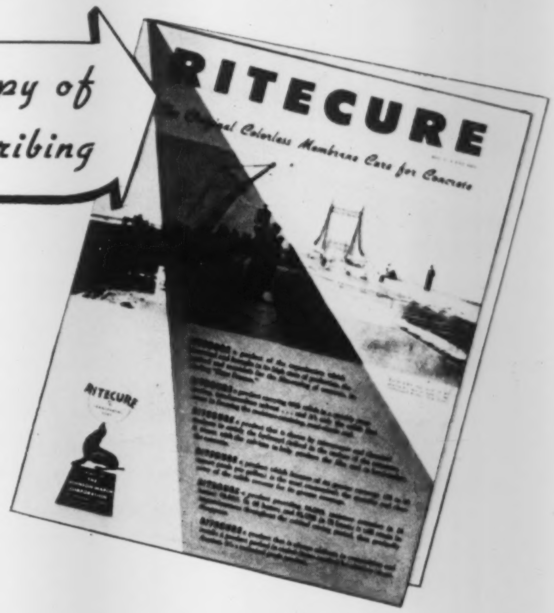

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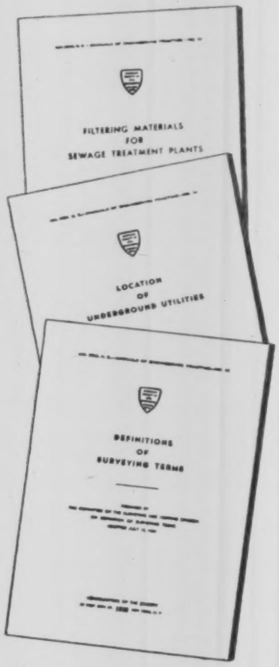
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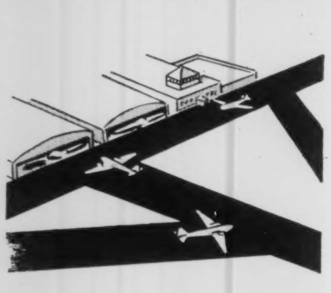

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TOTAL MEMBERSHIP AS OF FEBRUARY 9, 1943

Members	5,875
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Corporate Members	12,999
Honorary Members	36
Juniors	5,446
Affiliates	71
Fellows	1
Total	18,553
(Total Feb. 9, 1942	17,543)

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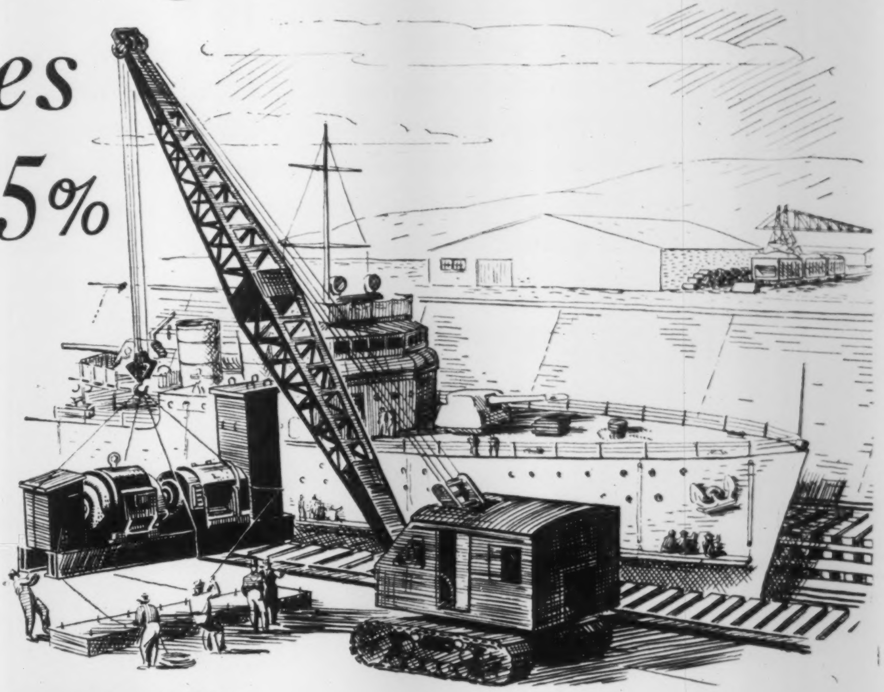
NICOLOFF, GEORGE BORIS (Jun. '42), Junior Naval Archt., U.S. Maritime Comm., 310 South Michigan Blvd., Chicago (Res., 307 West Harris, La Grange), Ill.

The Motor-generator Set that Saves Copper...85%

By
W. P. HEARSMANN
Industrial Department
General Electric Company



SUPPOSE you have grown up with ships — not sailing them but building and repairing them. And assume you have become the manager of a large shipbuilding and repair concern. With the outbreak of war you find that you have to expand your repair-dock facilities to meet the increased demands upon them.

In order to give adequate service to the ships that will depend upon your port facilities, you know that the dock must be equipped to supply several types of electric power; 110-volt, d-c auxiliary power; 110/220-volt, 3-wire auxiliary power; 110-volt, 3-phase a-c; and 220-volt, 3-phase a-c. Lately, too, ships are being equipped with 440-volt, 3-phase a-c power.

Obtaining copper for the necessary electric cables presents a serious problem. You recall having seen docks with cable ducts (in cross section) as big as 5 to 6 feet high and 3 to 4 feet wide, in order to supply ships with so many different types of electric power.

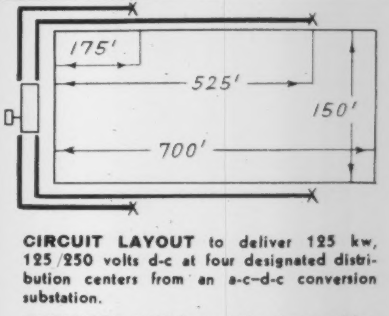
You talk the problem over with several manufacturers of electric equipment, and one of them suggests a system for your dock which will enable you to service any ship, and which will require considerably less copper than the conventional layout!

Instead of providing heavy copper ducts to supply both a-c and d-c, he suggests that you lay down a *basic network of relatively light copper to supply 2300-volt a-c over the entire dock area.* He points out that by this means several thousand kilowatts can be supplied at any point of a thousand-foot drydock, with power-outlet receptacles spaced as closely as desired. At these receptacles can be placed *portable unit motor-generator sets*—consisting of motor and generator, control, and motor magnetic switch. They can easily be moved about

by the cranes, which are part of your standard dock equipment. Of course, rectifiers can be used, and in cases where a-c power is needed, portable transformers can be placed at the power receptacles. The shore cables from the ship are then connected to the terminal receptacles which have been provided on the portable equipment.

While this suggestion may sound revolutionary, it has been recently applied successfully by the General Electric Company. The saving on copper can be computed from the accompanying diagrams. *The advantages of the system shown in Fig. 2 are that the voltage is improved, distribution losses in the cables are reduced, and 85 per cent of the copper normally required is saved.*

This is another example of the application of experience and skill by General Electric engineers to solve a problem created by today's conditions. If you have similar problems, we would like to work with you. General Electric Co., Schenectady, N. Y.

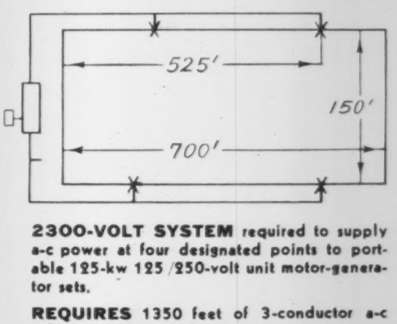


CIRCUIT LAYOUT to deliver 125 kw, 125/250 volts d-c at four designated distribution centers from an a-c–d-c conversion substation.

REQUIRES 1850 feet of d-c circuit cables, including lead-ins consisting of two 500,000-cm mains and one 4/0 neutral.

6900 pounds of copper needed

Fig. 1



2300-VOLT SYSTEM required to supply a-c power at four designated points to portable 125-kw 125/250-volt unit motor-generator sets.

REQUIRES 1350 feet of 3-conductor a-c cable, including lead-ins.

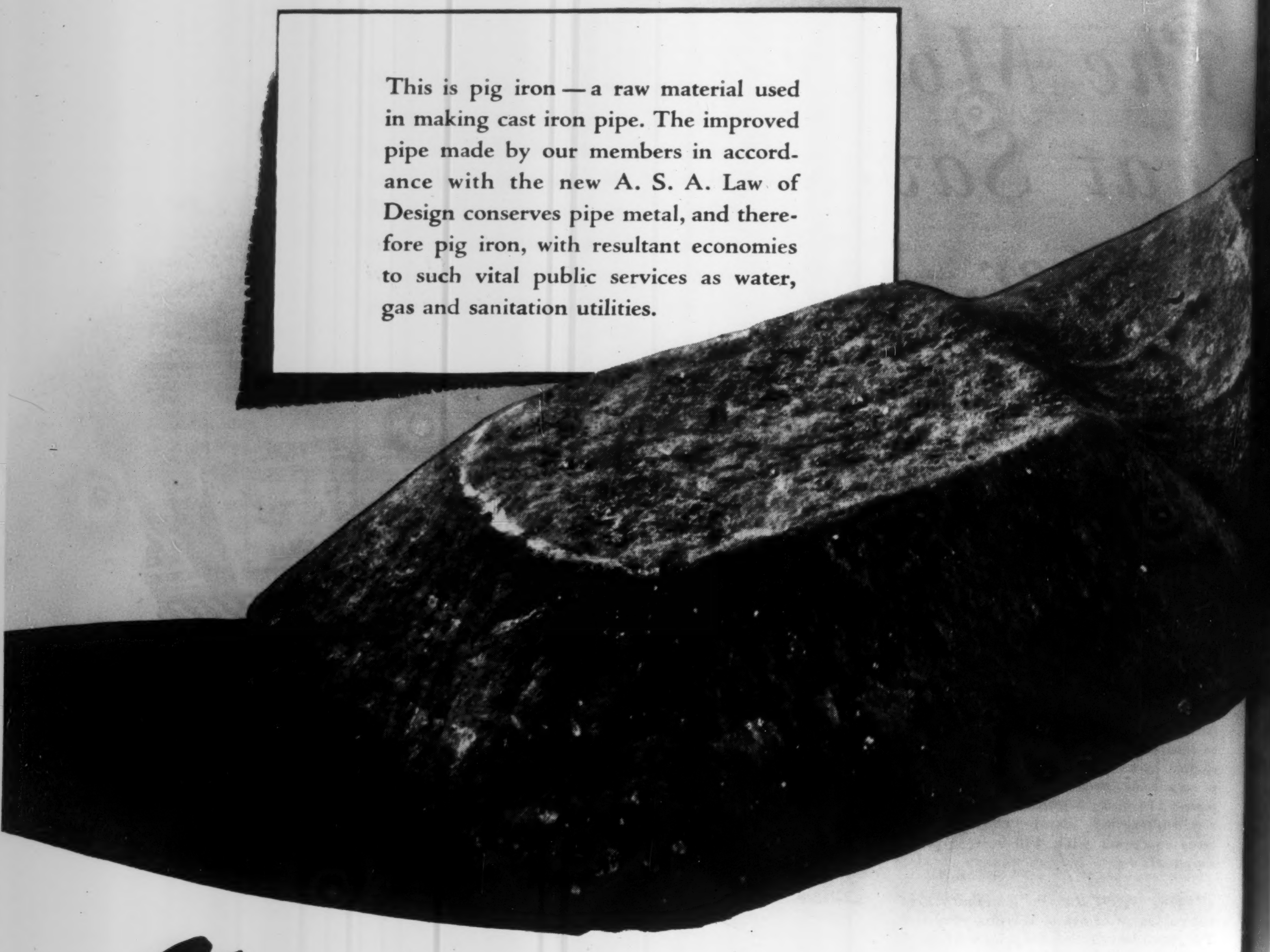
1045 pounds of copper needed

Fig. 2

GENERAL ELECTRIC

655-30-1200

The Army-Navy 'E', for Excellence in the manufacture of war equipment, now flies over six G-E plants employing 100,000 men and women.

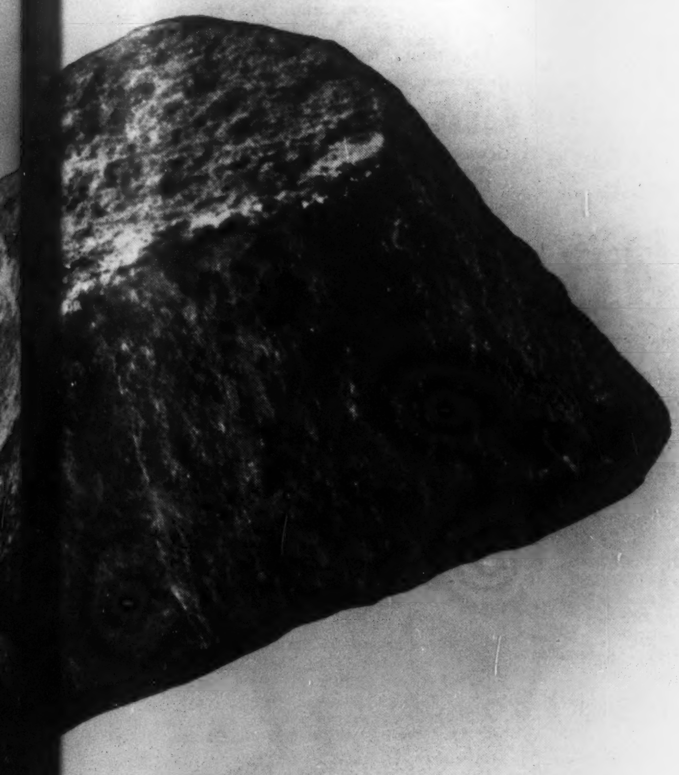


This is pig iron — a raw material used in making cast iron pipe. The improved pipe made by our members in accordance with the new A. S. A. Law of Design conserves pipe metal, and therefore pig iron, with resultant economies to such vital public services as water, gas and sanitation utilities.

Now CAST IRON PIPE BECOMES EVEN *more* ECONOMICAL

Yes, cast iron pipe, by far the lowest in cost per service year of all pipe materials used for underground mains, is now more economical than ever.

In January we announced that our members were making pipe in accordance with the recently adopted A.S.A. LAW OF DESIGN for cast iron pipe in underground service. And that this new Law of Design was the result of our cooperative study with consulting engineers and pipe users under the auspices



of the American Standards Association.

This new A. S. A. Law of Design means that the weights and thicknesses of cast iron pipe are *scientifically designed for specific laying conditions.* No more risk of under-guessing. No more over-guessing to be safe. You get the proper thickness for the service required.

Our members will of course continue to manufacture cast iron pipe in accordance with previously established specifications—A.W.W. A.—A. G. A.—Federal Government W W—P—421. But it will be obvious that the new factors in cast iron pipe design can save thousands of tons of metal with resultant large economies to pipe users.

Thus, cast iron pipe keeps in step with American Industry's swift wartime progress in design and production. Known for *longest life* by official records—proved to be *lowest in maintenance cost* by a nation-wide survey—*salvaged or re-used* by hundreds of cities—it is now scientifically designed for specific laying conditions. And it is more economical than ever. Cast Iron Pipe Research Association, Thomas F. Wolfe, Engineer, Peoples Gas Bldg., Chicago.

CAST IRON PIPE

RESEARCH ASSOCIATION, CHICAGO

CAST IRON

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Rock, Elmer (Jun. '37; Assoc. M. '42), Civ. Engr., Corps of Engrs., U.S. Army, 50 Whitehall St., Atlanta, Ga.

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Sahney, Jagdish Chandra (Jun. '33; Assoc. M. '41), Asst. Engr. Public Works Dept., Govt. of the United Provinces, Gorakhpur, India.

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Taylor, Marvin (Assoc. M. '38; M. '42), Capt., Corps of Engrs., U.S. Army, 1105 South Perry St., Montgomery, Ala.

Turnbull, Willard Jay (Assoc. M. '37; M. '43), Senior Engr., Chf., Soils Div., U.S. Waterways Experiment Station, Vicksburg, Miss.

Reinstatements

Brown, Hubert Hull, Assoc. M., reinstated Jan. 26, 1943.

Chittenden, Hiram Martin, Assoc. M., reinstated Jan. 19, 1943.

Feigel, John Henry, Assoc. M., reinstated Feb. 5, 1943.

Hall, Joseph Emmett, M., reinstated Jan. 28, 1943.

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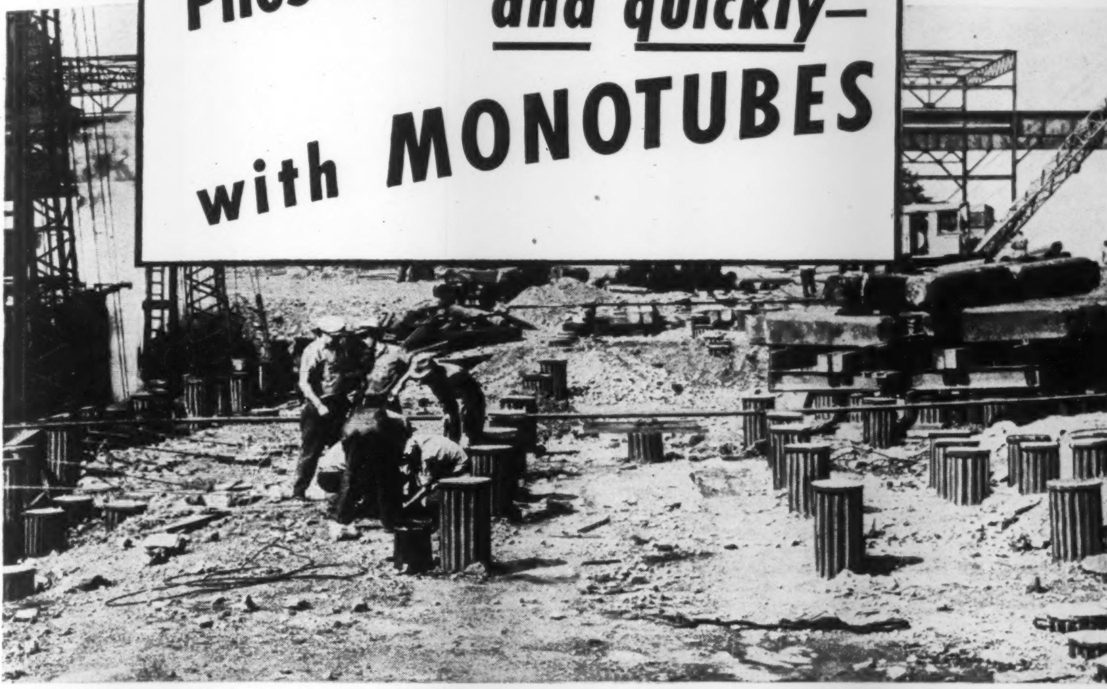

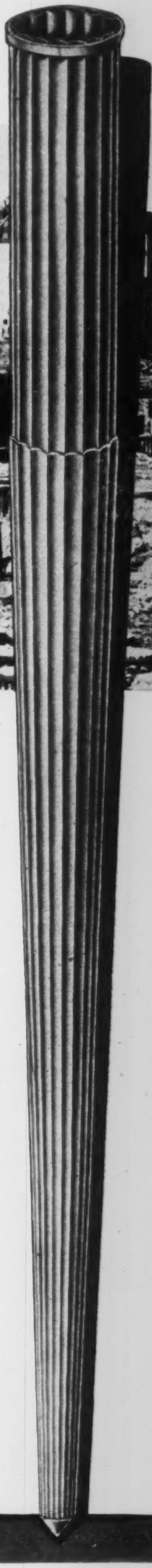

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SECOND—Monotubes are so strong and rigid they require no heavy core or mandrel and can be SPEEDILY DRIVEN with average job equipment (crawler crane equipped with standard leads and hammer).

THIRD—The use of extendible Monotubes permits SPEEDY INSTALLATION of VARYING PILE LENGTHS without delay or waste even in low headroom.

FOURTH—The hollow tubular design of Monotubes enables you to INSPECT CASINGS QUICKLY and thoroughly from top to toe before concreting.

Monotubes are available in gauges, tapers, and lengths to meet varying soil conditions, and Union Metal engineers stand ready to give you constructive help with your piling problems. Write for your copy of the Monotube Catalog 68A containing additional valuable information.

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Hodges, Richard McKandlish, M., reinstated Feb. 1, 1943.

Jakubowsky, Joseph Felix John, Jun., reinstated Jan. 30, 1943.

Johnson, Bazley Williams, Jun., reinstated Feb. 1, 1943.

Lofgren, Willard Emanuel, Assoc. M., reinstated Feb. 8, 1943.

McKee, Samuel Clair, M., reinstated Jan. 29, 1943.

Mapes, Charles Maynard, Assoc. M., reinstated Jan. 11, 1943.

Norcom, George Dusenbury, Assoc. M., reinstated Jan. 27, 1943.

Rose, Thomas Duncan, M., reinstated Jan. 21, 1943.

Russell, George Raymond, M., reinstated Jan. 27, 1943.

Savage, John Dana, Assoc. M., reinstated Jan. 19, 1943.

Smith, Alva J., M., reinstated Jan. 18, 1943.

Tandy, Milam Flack, Assoc. M., reinstated Jan., 25, 1943.

RESIGNATIONS

Bubar, Hudson Harris, M., resigned Dec. 31, 1942.

Bulger, John Wesley, Assoc. M., resigned Dec. 31, 1942.

Butler, Earl Summers, M., resigned Jan. 14, 1943.

Case, Charles Andrew, M., resigned Dec. 31, 1942.

Elliott, John Earle, M., resigned Feb. 1, 1943.

Fearing, Albert Justin, M., resigned Dec. 31, 1942.

Fitzsimons, Waveland Sinclair, Assoc. M., resigned Dec. 31, 1942.

Gordon, Ronald Arthur, Jun., resigned Dec. 31, 1942.

Greene, Kenneth John, Assoc. M., resigned Dec. 31, 1942.

Hageman, Harry Andrew, M., resigned Dec. 31, 1942.

Hatch, Harry Hovhan, M., resigned Dec. 31, 1942.

Hodgeson, Herbert Hardy, M., resigned Dec. 31, 1942.

Jacobson, Herman Anton, Assoc. M., resigned Jan. 15, 1943.

Kiker, John Ewing, Jr., M., resigned Jan. 15, 1943.

Robinson, Paul Thompson, M., resigned Dec. 31, 1942.

Rucker, Booker Hall, Jr., Jun., resigned Jan. 16, 1943.

Schofer, August, Assoc. M., resigned Dec. 31, 1942.

Stevens, Donald French, M., resigned Feb. 8, 1943.

Applications for Admission or Transfer

Condensed Records to Facilitate Comment from Members to Board of Direction

MARCH 1, 1943 NUMBER 3

The Constitution provides that the Board of Direction shall elect or reject all applicants for admission or for transfer. In order to determine justly the eligibility of each candidate, the Board must depend largely upon the membership for information.

Every member is urged, therefore, to scan carefully the list of candidates published each month in CIVIL ENGINEERING *and to furnish the Board with data which may aid in determining the eligibility of any applicant.*

It is especially urged that a definite recommendation as to the proper grading be given in each case, inasmuch as the grading must be based upon the opinions of those who know the applicant personally as well as upon the nature and extent of his professional experience. Any facts derogatory to the personal character or professional reputation of an applicant should be promptly communicated to the Board.

Communications relating to applicants are considered strictly confidential.

The Board of Direction will not consider the applications herein contained from residents of North America until the expiration of 30 days, and from non-residents of North America until the expiration of 90 days from the date of this list.

MINIMUM REQUIREMENTS FOR ADMISSION

Grade	General Requirement	Age	Length of Active Practice	Responsible Charge of Work
Member	Qualified to design as well as to direct important work	35 years	12 years	5 years RCM*
Associate Member	Qualified to direct work	27 years	8 years	1 year RCA*
Junior	Qualified for subprofessional work	20 years	4 years	
Affiliate	Qualified by scientific acquirements or practical experience to cooperate with engineers	35 years	12 years	5 years RCM*

* In the following list RCA (responsible charge—Associate Member standard) denotes years of responsible charge of work as principal or subordinate, and RCM (responsible charge—Member standard) denotes years of responsible charge of IMPORTANT work, i.e., work of considerable magnitude or considerable complexity.

APPLYING FOR MEMBER

Akkerman, Richard Pete, Houston, Tex. (Age 39) (Claims RCA 6.1 RCM 8.4) May 1942 to date Engr., Houston Shipbuilding Corporation; previously with F. J. Niven, Cons. Engr.; Engr., Sheffield Steel Corporation; Contr.'s Engr., Favorot & Peterkin, Gen. Contrs.; Engr., J. Ray McDermott Constr. Co., Harvey, La.; with Gulf Oil Corporation.

Ames, Carl Lloyd, Wisconsin Dells, Wis. (Age 36) (Claims RCA 4.5 RCM 8.7) Jan. 1942 to date Eng. Designer, Mason & Hangar Co., A. E. M. Badger Ordnance Works, Baraboo, Wis.; previously member of firm, Ames & Trapp, Archts., Milwaukee; in private practice.

Barrett, Willis Chapel, El Centro, Calif. (Age 51) (Claims RCA 2.6 RCM 20.9) Aug. 1935 to date with SCS in various capacities, at present with Div. of Irrigation, Berkeley.

Bassford, Henry Hall, Cranford, N.J. (Age 60) (Claims RCA 10.0 RCM 27.0) 1942 Chf. Engr., Supt., Operations Engr., and Utility Engr., Fort Kobbe; previously Project Chf., Field and Cost Engr., Leonard Constr. Co.; Project Supervisor, New York City Housing Authority; Engr.-Supervisor, Dept. of Parks, New York City.

Bleich, Friedrich, Detroit, Mich. (Age 64) (Claims RCA 4.0 RCM 34.8) 1941 to date with Albert Kahn, Inc., Arch. & Engr.; previously with Eisenbau Gesellschaft Zurich, Zurich, Switzerland; Cons. Engr., Vienna, Austria.

Brown, Hoyt Cuthbert, Macon, Ga. (Age 47) (Claims RCA 5.7 RCM 11.8) July 1942 to date in private practice; previously Project Mgr. and Supt., MacDougald Constr. Co., Atlanta; Div. Engr., Georgia Highway Board, Macon.

Charles, Jack Randolph, Boulder City, Nev. (Age 37) (Claims RCA 2.0 RCM 13.5) 1941 to 1943 with Basic Magnesium, Inc.; previously Chf. Engr., Magnesium Elektron Ltd., Manchester, England.

Clyde, James Edward, Miami, Fla. (Age 42) (Claims RCA 11.2 RCM 8.5) July 1942 to date with Pan American Airways as Res. Engr. and (since Nov. 1942) Project Mgr.; previously Engr. with Walsh-Driscoll, Contrs. on Army Base at Trinidad, B.W.I.; in private practice; Asst. Engr. on WPA work and with Onondaga Public Works Comm.

Creamer, Wilcox Asten, Pelham, N.Y. (Age 49) (Claims RCA 2.0 RCM 18.0) 1940 to date with Pan American Airways-Africa, Ltd., as Asst. Chf. of Constr. in United States and Africa; previously in private practice as member of firm, Gretsch & Creamer, Engrs., then as W. A. Creamer.

Darling, Herbert Franklin, Eggertsville, N.Y. (Age 38) (Claims RC 15.1 D 0.3) Aug. 1941 to date Owner, H. F. Darling, Gen. Contr.; previously Engr., Mgr., and Partner, Connelly Bros., Cincinnati, Ohio.

Decker, Elbert Leroy (Assoc. M.), Parker, Ariz. (Age 55) (Claims RCA 3.1 RCM 21.7) April 1942 to date Senior Engr., Colorado River War Relocation Project, Poston, Ariz.; previously Constr. Engr., Willow Creek Dam, Crow Project, Montana.

Dugger, Eugene Frank, Newport News, Va. (Claims RCA 5.0 RCM 12.7) (Age 44) June 1926 to date Gen. Mgr., Newport News Waterworks Comm.

Gardner, Werner Clarke (Assoc. M.), Salisbury, Md. (Age 40) (Claims RCA 5.5 RCM 11.4) March 1926 to date with City of Salisbury, Md., in various capacities, since July 1936 as City Engr. and Supt. of Water Dept.

Garrett, Ben Screws, Dallas, Tex. (Age 43) (Claims RCA 6.2 RCM 12.0) Aug. 1939 to date member of firm, Burleson-Garrett, Cons. Engrs.; previously Dist. Engr., Magnolia Petroleum Co., Dallas.

Geis, Frederick Louis, Jr., Diablo Heights, C.Z. (Age 50) (Claims RCM 19.2) 1924 to date with U.S. Engrs., in various capacities, since Aug. 1940 as Chf. of Operations, Panama Canal Third Locks construction.

Giese, John Rossi, Camp Hill, Pa. (Age 36) (Claims RCA 4.1 RCM 7.3) June 1937 to date with Modjeski & Masters, as Res. Engr. and Liaison Officer, Executive Asst. Engr., and (since Jan. 1942) Staff Member.

Gilman, Lydon Ainsworth, Houston, Tex. (Age 40) (Claims RCA 8.2 RCM 5.3) 1940 to date Engr., Mosher Steel Co.; previously with Gilman Building Co., Kansas City, Mo., and San Antonio, Tex.

Gwinn, Abner, Fort Leonard Wood, Mo. (Age 40) (Claims RCA 4.2 RCM 12.2) June 1942 to date with Horner & Shifrin of St. Louis, as Res. Engr. for Archt.-Engr., Fort Leonard Wood, Mo.; previously with Missouri State Highway Dept. in various capacities, finally as Traffic Engr.-Accident Analyst.

Harbaugh, Yost Daniel, Washington, D.C. (Age 41) (Claims RCA 5.6 RCM 7.7) Oct. 1920 to date with District of Columbia Sewer Div., in various capacities, since Oct. 1938, being Constr. Engr.

Hardy, Conrad Palmer, Baltimore, Md. (Age 50) (Claims RCA 1.0 RCM 20.0) 1917 to date with Corps of Engrs., U.S. Army, in various capacities, since 1941 as Dist. Engr., Baltimore (Md.) Engr. Dist.

Harrington, Joseph John, Brooklyn, N.Y. (Age 36) (Claims RCA 6.7 RCM 8.0) 1941 to

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date Constr. Engr., J. G. White Eng. Corporation; previously Engr., Estimator and Supt., George J. Atwell Foundation Corporation.

JOHNSON, CHARLES FRANKLIN (Assoc. M.), Louisville, Ky. (Age 45) (Claims RCA 15.4 RCM 6.2) July 1930 to date with Commrs. of Sewerage, Louisville, as Jun. Engr., Senior Engr., Acting Chf. Engr., and (since Aug. 1942) Chf. Engr.

JOHNSON, CLARENCE WEST (Assoc. M.), Gorgas, Ala. (Age 48) (Claims RCA 14.2 RCM 10.9) Sept. 1941 to date Project Engr. and Constr. Supt., Alabama Power Co.; previously Office Engr., Kingsbury (Ind.) Ordnance Plant; Field Engr., Rust Eng. Co., Mobile, Ala.; Field Engr., Hollingsworth & Whitney Co., Mobile; Asst. Engr., U.S. Engr. Office, Mobile; Drainage Engr., Mississippi Planning Comm.

KASLER, CLINTON EUGENE, Jefferson City, Mo. (Age 39) (Claims RCA 7.8 RCM 10.0) May 1942 to date with Western Contr. Corporation, as Constr. Engr. and Asst. Project Mgr., and (since Dec. 1942) Project Mgr.; previously with Missouri Highway Dept., in various capacities, finally as Asst. Div. Constr. Engr.; Engr., Martin Wunderlich Co., Jefferson City, Mo.

KAUER, THEODORE JOSEPH, Silver Spring, Md. (Age 38) (Claims RCA 6.2 RCM 8.1) April 1941 to date Asst. Secy. and Washington (D.C.) Representative, American Concrete Pipe Association; previously Airport Engr. (paving), CAA, Washington, D.C.; with Ohio Highway Dept. in various capacities, finally as Engr. of Design, Cleveland Planning Office.

KULP, BURR ROBERT, Chicago, Ill. (Age 59) (Claims RCM 30.8) 1905 to date with Chicago & North Western Ry. Co. in various capacities, since April 1940 as Chf. Engr.

LANE, ALBERT LOSSEN (Assoc. M.), Seattle, Wash. (Age 49) (Claims RCA 9.7 RCM 8.2) Sept. 1917 to date with U.S. Army, at present as Col., Corps of Engrs.

LEARY, WILFRED JOHN, Butte, Mont. (Age 40) (Claims RCA 1.4 RCM 10.5) May 1942 to date Runway and Road Engr., Pleasantville Constrs., Inc.; previously Airport Engr. (Paving), Airport Div., CAA; with Montana Highway Dept. in various capacities, finally as Div. Engr.

LETOURNEAU, DORIA GEORGE (Assoc. M.), Mt. Holly, N.J. (Age 37) (Claims RCA 3.1 RCM 6.5) Feb. 1942 to date with Brann & Stuart Co., as Res. Engr., and (since Sept. 1942) Project Mgr.; previously Chf. Res. Engr., Hunting, Davis & Dunnells, Archt.-Engr.; Engr., U.S. Zone QM. Office Army Base, Boston, Mass.; Res. Engr., Steubenville (Ohio) Bridge Co.

McIVER, ANGUS VAUGHN (Assoc. M.), Great Falls, Mont. (Age 50) (Claims RCA 13.8 RCM 13.8) Oct. 1942 to date with FPHA; previously Archt. and Engr., Dist. Engr. Office, U.S. Engrs., Fort Peck; in private practice, Great Falls, Mont.

MARDON, HENRY HERBERT, London, England. (Age 40) (Claims RCA 7.0 RCM 10.1) 1942 to date Programmes Intelligence Officer, Ministry of Works; previously Agent, Humphreys, Ltd.; Constr. Mgr., British Oxygen Co., Ltd.

MOLKE, ERIC CARL, Washington, D.C. (Age 42) (Claims RCA 9.8 RCM 8.0) Jan. 1937 to date with Roberts & Schaefer Co., as Structural Engr., Chicago, Ill., and (after Jan. 1939) Mgr., Eastern Branch Office, Washington, D.C.

MOORE, HERBERT (Assoc. M.), Milwaukee, Wis. (Age 37) (Claims RCA 2.7 RCM 5.8) July 1939 to date Cons. Engr.; previously with Jerry Donohue Eng. Co., Sheboygan; Greeley & Hansen, Cons. Engrs.

MUHS, FRED ROSS, JR. (Assoc. M.), San Francisco, Calif. (Age 38) (Claims RCA 3.0 RCM 6.0) Jan. 1936 to date Gen. Supt., San Francisco Bridge Co.

MULHOLLAND, ROYE ARTICE, Johnson City, Tenn. (Age 37) (Claims RCA 4.0 RCM 9.7) March 1942 to date Eng. Designer, Chas. T. Main, Inc., Greenwood, Miss., and Kingsport, Tenn.; previously Chf. of Party and Office Engr., Red River Ordnance Depot, Texarkana, Tex.; with Texas Highway Dept., on work at Marshall Ford Dam; private construction.

OLESON, CALVIN CARL (Assoc. M.), Brookings S.Dak. (Age 41) (Claims RC 12.9 D 1.8) Sept. 1936 to June 1937 Instructor in, Sept. 1927 to June 1941 Asst. Prof., and Sept. 1941 to date Associate Prof. and Acting Head of Dept. of Civ. Eng., South Dakota State Coll.; in the interim Research Asst., Portland Cement Association, Chicago, Ill.; Dist. Concrete Engr., Pennsylvania Turnpike Comm., Harrisburg, Pa.; Res. Engr., City of Brookings, S.Dak.

OLSEN, ARTHUR KERSHAW, Diablo Heights, C.Z. (Age 39) (Claims RCM 13.8) Dec. 1941 to date Asst. Chf. of Operations, Constr. Sec., Special Eng. Div., Panama Canal; previously Gen. Mgr. and Engr., Creston (Iowa) City Water Works.

PAGE, RANDOLPH ROSEWELL, Brunswick, Ga. (Age 58) (Claims RCA 18.4 RCM 14.8) Aug. 1942 to date Senior Civ. Engr., U.S. Civil Service Comm.; previously Area Engr., FWA; Maintenance Supt., Maintenance Supervisor (Area Office) and Res. Engr., South Carolina Highway Dept.

RAIDER, HARRY ADAM (Assoc. M.), Baltimore, Md. (Age 62) (Claims RCA 2.0 RCM 28.8) Jan. 1922 to date Pres., Chinese Eng. & Development Co.

ROSENGARTEN, CARL ALFRED (Assoc. M.), Brookline, Pa. (Age 40) (Claims RCA 3.4 RCM 9.3) April 1935 to date Architectural and Structural Engr., The Ballinger Co., Archts. and Engrs., Philadelphia.

SCHRYVER, HOWARD FRENCH (Assoc. M.), Lakewood, Ohio. (Age 57) (Claims RCA 13.0 RCM 16.0) 1910 to date with New York Central R.R. in various capacities, since 1931 being Asst. Engr., acting as Office Engr., and (past year) as Representative of Asst. Vice-Pres. and Gen. Mgr. on U.S. War Dept. service.

SEDDON, ROBERT STEERE, Norfolk, Va. (Age 40) (Claims RCA 6.0 RCM 8.3) May 1941 to date with U.S. Navy, as Lieut., and (at present) Lt. Comdr., being Officer in Chg., 17th Constr. Bn., previously with Bethlehem Steel Co., Quincy, Mass.; Associate Cons. Engr., White & Burke, Springfield, Mass.

SHOEMAKER, ROBERT RADCLIFFE, Long Beach, Calif. (Age 45) (Claims RC 12.4 D 10.2) Jan. 1940 to date Chf. Engr., Long Beach Harbor Dept., previously Draftsman, Structural Engr., Civ. Engr., etc., City of Los Angeles Bldg. and Safety Dept. and Harbor Dept.

SHUMAKER, CLARENCE ARNOLD, Prescott, Ark. (Age 44) (Claims RCA 4.4 RCM 15.0) June 1942 to date 1st Lieut., Corps of Engrs., U.S. Army; previously with Arkansas Highway Comm. as Res. Engr., Asst. Engr. and Office Engr.

STRATTON, JAMES HOBSON (Assoc. M.), Arlington, Va. (Age 44) (Claims RCA 13.0 RCM 9.5) 1920 to date with U.S. Army, Corps of Engrs., as 2d Lieut., 1st Lieut., Captain, and at present Lt. Col.

SULLIVAN, EDWIN QUINBY (Assoc. M.), San Bernardino, Calif. (Age 55) (Claims RCA 13.0 RCM 19.4) Aug. 1914 to date with Div. of Highways, California Dept. of Public Works, since March 1926 as Dist. Engr., Dist. VIII.

TELLER, LESLIE WAYNE, SR. (Assoc. M.), Chevy Chase, Md. (Age 49) (Claims RCA 7.9 RCM 17.5) 1920 to date with U.S PRA in various capacities, at present being Sec. Head directing research.

TEMPLE, STANLEY ALEXANDER, Washington, D.C. (Age 46) (Claims RCA 7.7 RCM 11.2) Sept. 1920 to Feb. 1922 and Oct. 1924 to date with Baltimore & Ohio R.R., in various capacities, since April 1941 as Industrial Agt.

THOMAS, JOHN IRA, Louisville, Ky. (Age 37) (Claims RCA 4.5 RCM 6.2) April 1931 to date with U. S. Engr. Office in various capacities, since Dec. 1938 as Associate Engr., Engr. and Senior Engr.

TOMLIN, ROBERT KINGSLEY, New York City. (Age 57) (Claims RCA 3.2 RCM 25.8) Jan. 1928 to date Editor-in-Chief of magazine, *Construction Methods*.

APPLYING FOR ASSOCIATE MEMBER

BALLENGER, ROBERT DANIEL, Atlanta, Ga. (Age 33) (Claims RCA 4.0) Feb. 1942 to date in Office of Div. Engr., South Atlantic Div.; previously with Bridge Dept., Georgia Highway Dept.; Regional Office, PWA, Atlanta.

BOWERS, DOUGLAS ALBERT (Junior), Oklahoma City, Okla. (Age 33) (Claims RCA 4.4 RCM 0.2) June 1942 to date Testing Engr., The Austin Co., Oklahoma City aircraft assembly plant; previously with Oklahoma Highway Comm. in various capacities, finally as Gen. Supervisor of Road Inventory and Road Life.

BEALL, JOEL CHAMBLESS (Junior), Macon, Ga. (Age 28) (Claims RCA 3.7) March 1940 to date Associate Engr., Georgia Dept. of Public Health, Atlanta; previously Public Health Engr., Colquitt County Health Dept., Moultrie, Ga.

BRUCE, HENRY CLAY, Sacramento, Calif. (Age 38) (Claims RCA 3.6) June 1938 to date with U.S. Dist. Engr., as Senior Eng. Draftsman, Prin. Eng. Aide (Civ.), Chf. Eng. Aide (Civ.), and (since July 1942) Asst. Engr. (Civ.).

BUMSTEAD, JOHN CHAMBERS (Junior), Upper Marlboro, Md. (Age 29) (Claims RCA 3.4 RCM 0.3) Sept. 1942 to date Design Engr., Gannett, Eastman & Fleming, Inc.; previously Asst. Engr., Havens & Emerson, Walnut Ridge, Ark.; with TVA; Asst. Engr. with City Engr., Saratoga Springs, N.Y.

BURMEISTER, ROBERT AUGUST, Milwaukee, Wis. (Age 36) (Claims RCA 9.3 RCM 2.3) June 1928 to June 1930 Asst. in charge of Tests and Oct. 1942 to date Laboratory Engr., Milwaukee Bureau of Street Constr.; in the interim Asst. Highway Engr., Wisconsin Highway Comm.

CAPP, CRAIG THOMAS (Junior), Fair Oaks, Pa. (Age 33) (Claims RCA 3.4) March 1937 to date with American Bridge Co. on structural steelwork, and (since Jan. 1939) with Marine Dept.

CASCINO, DAVID DOMINIC (Junior), Garfield, N.J. (Age 29) (Claims RCA 2.1 RCM 3.1) Jan. 1939 to July 1940 City Engr. and Supt. of Public Works, and Jan. 1941 to date City Engr., Garfield, N.J.; since June 1942 also Structural Engr., Mahoney-Troast Constr. Co.; in the interim Civ. Engr., Francisco & Jacobus, Engrs. & Archts., New York City.

CONTI, ARNOLD WILLIAM, Jacksonville, Fla. (Age 35) (Claims RCA 8.0 RCM 5.2) March 1942 to date Lieut. (CEC), U.S.N.R., since April 1942 being Officer-in-Chg. of construction; previously Pres. and Constr. Supt., Conti & Donahue, Gen. Contrs., Lynn, Mass.

CORDLE, THOMAS LLEWELLIN, Charlotte, N.C. (Age 30) (Claims RCA 6.3 RCM 1.1) Jan. to July 1941 Designer, and March 1942 to date Engr., J. N. Pease & Co.; in the interim Office Engr., Office of Area Engr., Camp Sutton, N.C.; Asst. Engr., Dietrick & Olsen; previously Town Mgr. and Engr., Apex and Fuquay Springs, N.C.

DAVY, PHILIP SHERIDAN (Junior), Ft. Leonard Wood, Mo. (Age 27) (Claims RCA 2.1 RCM 2.4) March 1941 to date with Quartermaster Corps, U.S. Army as 1st Lieut., and at present Capt., Corps of Engrs., being Post Engr., Ft. Leonard Wood, Mo.; previously member of firm, Frank J. Davy & Son, Cons. Engrs.

DOOLITTLE, WILLIAM KARL, Midland, Mich. (Age 52) (Claims RCA 8.1) Feb. 1942 to date Squad Leader, Concrete and Structural Steel Designer, The Austin Co.; previously Concrete and Structural Steel Designer, McKenzie Hague Co.; with Minneapolis Water-Works Dept.

DUCKERING, CHARLES ELMHIRST, Fresno, Calif. (Age 35) (Claims RCA 2.9 RCM 0.1) Sept. 1938 to April 1939 and Aug. 1939 to Jan. 1942 Surveyor, Jan. to July 1942 Asst. Engr., and July 1942 to date Associate Engr., U.S. Engr. Office, War Dept.; in the interim with U.S. Forest Service.

EVANS, GEORGE WILLIAM (Junior), Howard Field, Canal Zone. (Age 28) (Claims RCA 4.1) Dec. 1941 to date with U.S. Engr. Dept., Panama Div., as Chf. Eng. Aide, and (since June 1942) Engr.; previously Associate Contract Engr., FSA; with United Fruit Co., as Jun. Engr., and Asst. Engr.; with Georgia Highway Dept., Post Roads Div.

EVANS, PAUL EDWARD, Bishop, Calif. (Age 39) (Claims RCA 6.5) Aug. 1942 to date Airport Paving Engr., Marine Corps Air Bases, at Mojave Base, and (since Dec. 1942) at El Centro, Calif.; previously with California Div. of Highways, as Jun. Highway Engr., Res. Engr., and Dist. Materials Engr. (Acting).

GILLIAM, CYRIL OLIVER, Phoenix, Ariz. (Age 41) (Claims RCA 12.1) May 1937 to June 1942 and Nov. 1942 to date in private practice as Archt. & Engr., Phoenix; in the interim Senior Engr., Hunt, Chambers & Ellingwood, Archt. & Engrs.; Constr. Engr., Bobo & Springfield, Contrs.

GREENE, CUVIER, Los Angeles, Calif. (Age 51) (Claims RCA 9.1 RCM 2.7) May 1941 to date Dept. Head, Leeds, Hill, Barnard & Jewett, Los Angeles; previously in private practice.

GUTHRIE, PERCY LEE, Dandridge, Tenn. (Age 34) (Claims RCA 3.6) Oct. 1935 to date with TVA, as Inspector of Constr., Asst. Civ. Engr., Associate Civ. Engr., and (since May 1941) Civ. Engr., at present on work at Douglas Dam.

HAGADORN, LESTER THEODORE, Salina, Kans. (Age 38) (Claims RCA 8.0) 1934 to date Engr., Paulette & Wilson and their successors, Wilson & Co., Engrs., Salina, Kans.

HECHMER, WILLIAM LOUIS (Junior), Arlington, Va. (Age 28) (Claims RCA 4.3) Dec. 1938 to date with Mohler Constr. Co., Washington, D.C., as Supt., Engr. and Estimator, and (since May 1942) Superv. Engr.

HINSHAW, JOHN CARL WILLIAMS, Washington, D.C. (Age 48) (Claims RC 4.9 D 2.0) Jan. 1940 to date Representative, 76th–78th Congresses of the U.S.; previously in real-estate investment and brokerage business, and (1934) became Pres., Pasadena (Calif.) Realty Board.

HOWE, HERBERT EDWARD, Fountain City, Tenn. (Age 38) (Claims RCA 8.7) June 1936 to date with TVA in various capacities, since Jan. 1942 as Asst. to Project Engr.

JOHN, ROBERT LANDIS, Philadelphia, Pa. (Age 30) (Claims RCA 6.3) Nov. 1941 to date Asst.

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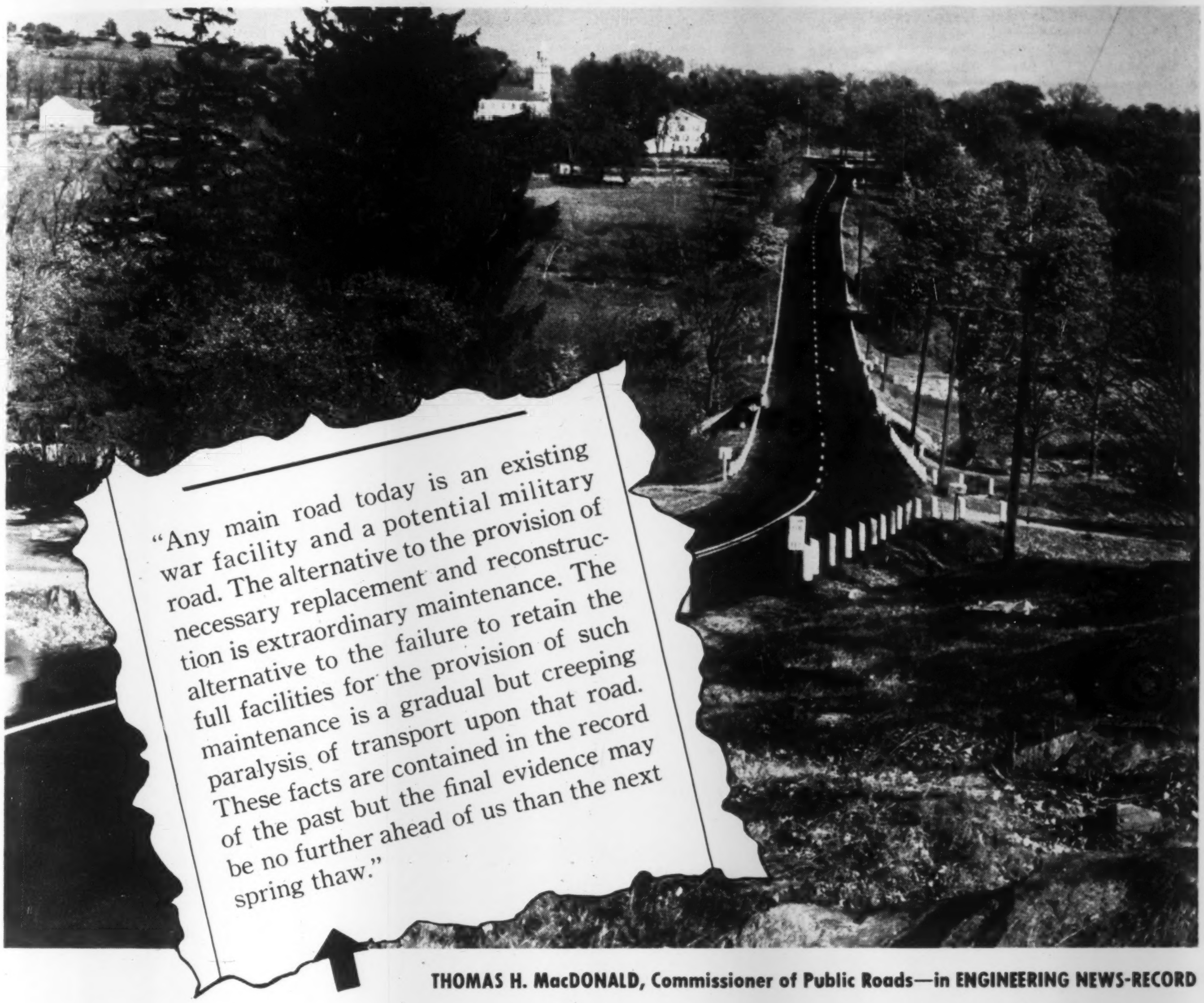

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THOMAS H. MacDONALD, Commissioner of Public Roads—in ENGINEERING NEWS-RECORD

THUS Commissioner MacDonald sums up the vital problem of wartime road maintenance and repair that faces highway officials and engineers today.

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Engr., Philadelphia, Bureau of Water, Water-Works Improvement; previously Asst. Civ. Engr., War Dept., Ordnance Div.; with The Chester Engrs., Pittsburgh, as Engr. and Res. Engr.

Johnson, Bruce Maxwell, Tacoma, Wash. (Age 35) (Claims RCA 5.7) June 1941 to date Asst. Designing Engr., 2d Nisqually Power Development, City of Tacoma; previously Asst. Engr. and Associate Engr., Special Eng. Div., The Panama Canal.

Lierboe, Rinard Theodore, Jr. (Junior), Charleston, S.C. (Age 30) (Claims RCA 5.1 RCM 3.8) Jan. 1941 to date Asst. Civ. Engr., and Associate Civ. Engr., Public Works Dept., U.S. Navy, Charleston, S.C.; previously Constr. Engr., Chas. W. Angle, Inc., Marine Barracks, Parris Island, S.C.; with U.S. Govt. Fish & Wildlife Service in various capacities.

Longwell, William Francis Merwin, Hamden, Conn. (Age 41) (Claims RCA 2.5 RCM 3.3) July 1942 to date graduate student (fellowship), Yale Univ.; previously Associate Prof. and Instructor, Virginia Polytechnic Inst., Blacksburg.

Lott, Herbert Dale, Jackson, Miss. (Age 36) (Claims RCA 6.2) June 1941 to date with Burns & McDonnell Eng. Co., as Inspector, Asst. Engr., and (since Sept. 1942) Chf. Surveyor; previously Chf. of Party, Hahner-Foreman & Armagost; Sec. Chf., Widmer Eng. Co.; with WPA; Chf. of Party, Champlin Refining Co.; Asst. County Engr., Cheyenne County, Kans.

McKinley, Reed, Kansas City, Mo. (Age 48) (Claims RCA 6.2 RCM 7.1) May 1940 to date City Engr., Dept. of Public Works, Kansas City; previously Associate Engr., PWA and FWA, Omaha and (later) Chicago.

Maynard, Stuart Barton, Germantown, Pa. (Age 36) (Claims RCA 7.9) Oct. 1940 to date Asst. Engr. and 2d Asst. Engr. of Design, Bureau of Water, Philadelphia; previously Designing Engr., Greeley & Hansen, Chicago, Ill.

Messinger, Henry McClure, Bastrop, La. (Age 30) (Claims RCA 5.4) July 1941 to Jan. 1942 Draftsman, and Nov. 1942 to date Party Chf., Huey & Cage, Monroe, La.; in the interim Party Chf., Ford, Bacon, & Davis, Inc.; previously Progress Engr. and Draftsman, W. Horace Williams Co., Camp Claiborne, La.; with Parish Surveyor, Bastrop, La., in various capacities.

Mousel, Paul Welty, Lincoln, Nebr. (Age 38) (Claims RCA 4.8 RCM 2.9) Dec. 1942 to date with Maxon Constr. Co., U.S. Naval Ammunition Depot, Hastings, Nebr.; previously Chf. Engr., Davis & Wilson, Archts. & Engrs.; Res. Engr. and Civ. Engr., Henningson Eng. Co., Omaha; Area Supervisor, NYA, Omaha; Party Chf., Central Nebraska Public Power & Irrigation Dist.

Mullan, Albert Charles (Junior), Philadelphia, Pa. (Age 33) (Claims RCA 4.5 RCM 0.3) Dec. 1942 to date Senior Industrial Designing Draftsman, United Engrs. & Constrs.; Designing Draftsman (industrial), Day & Zimmermann, Inc.; with Philadelphia Navy Yard.

Newman, Jack Lewis, Sacramento, Calif. (Age 34) (Claims RCA 2.8 RCM 2.3) 1931 to date with U.S. Engr. Dept., Sacramento, Calif., in various capacities, since July 1942 being Major, Army Specialist Corps, and since Jan. 1943, with Corps of Engrs., U.S. Army.

Orndorff, Roy Lee, Arlington, Va. (Age 38) (Claims RCA 7.8 RCM 1.5) Dec. 1937 to date with Water Div., Dist. of Columbia, as Asst. Engr., Associate Engr., and (since Dec. 1942) Engr. of Design and Constr., since May 1942 (evenings) at George Washington Univ., at present as Lecturer.

Pien, Chung Ling, Cleveland, Ohio. (Age 34) (Claims RCA 2.0) May 1942 to date Structural Eng. Designer with Arthur G. McKee & Co., Cleveland, and (since Aug. 1942) with American Gas & Elec. Service Corporation, New York City; Mech. Eng. Designer, Stone & Webster Eng. Corporation, Boston, Mass.; Research Asst., State Univ. of Iowa.

Reid, John Lewis, Alexandria, Va. (Age 34) (Claims RCA 4.1 RCM 3.9) April 1942 to date Lt., CEC, U.S. Navy, Bureau Yards & Docks, War Plans Div., Washington, D.C.; previously with Constr. QM., War Dept., Washington; Engr., Central Mining Co., Winnemucca, Nev.

Richards, Stephen Carpenter, White Plains, N.Y. (Age 34) (Claims RCA 5.0 RCM 6.6) May 1942 to date Gen. Supt., Walsh Constr. Co. and J. Rich Steers, Inc.; previously Constr. Supt., Contrs. for Dry Docks, Brooklyn (N.Y.) Navy Yard; with Associated Contrs. Inc.; with Walsh Constr. Co., as Estimating Engr., Field Engr., and Constr. Supt.

Scott, Harold Austin, Sr., Jacksonville, Fla. (Age 36) (Claims RCA 5.0 RCM 3.9) Nov. 1935 to March 1936 Student Engr., Aug. 1936 to Aug. 1940 Jun. Engr., and Aug. 1940 to date Associate Engr., U.S. Engr. Office; in the interim Res. Engr., Massachusetts Inst. of Technology.

Sharistanian, Arthur Jacob, Worcester, Mass. (Age 35) (Claims RCA 4.6) June to Dec. 1942 Asst Engr., Ritchie-Ellsworth, Archt.-Engrs., Camp Edwards, Mass.; previously Steel Foreman, Robertson-Henry Co. & Sanders Eng. Co. at Portsmouth (N.H.) Navy Yard; Civ. Engr., Arthur C. Stanley Co., Inc., Contrs., So. Portland (Me.) Shipbuilding Corporation; Draftsman and Chf. of Party, Chas. T. Main, Inc., Engrs., Boston; Jun. Eng. Aide, Metropolitan Dist. Water-Supply Comm., Boston.

Sheets, William Lawrence, Williamsport, Pa. (Age 36) (Claims RCA 5.5 RCM 1.5) Jan. 1941 to date with Stone & Webster Eng. Corporation as Subcontract Engr. and (since March 1942) Res. Engr.; previously with U.S. Engr. Dept., St. Louis, Mo., in various capacities.

Smith, Robert, Jr., Cleveland, Ohio. (Age 38) (Claims RCA 11.6) Feb. 1932 to date with The Austin Co., Cleveland, as Archt. and (since Jan. 1935) Chf. Archt.

Steele, Donald Jefferson, San Francisco, Calif. (Age 40) (Claims RCA 9.0 RCM 7.0) Aug. 1924 to date with U.S. Public Roads Administration, in various capacities and (past 7 years) Dist. Materials Engr.

Stein, David, New York City. (Age 41) (Claims RCA 13.4) Oct. 1936 to date Civ. Engr. (Water Supply), Board of Water Supply.

Swenson, Carl Leslie, Mt. Kisco, N.Y. (Age 49) (Claims RCA 8.0 RCM 13.0) 1922 to date with Foley Brothers, Inc., St. Paul, Minn., as Eastern Mgr., and (since 1930) Executive Vice Pres., and Gen. Mgr., Pleasantville, N.Y.

Taylor, Alton Roderick, Birmingham, Ala. (Age 34) (Claims RCA 5.9) June 1942 to Jan. 1943 Chf. Draftsman, J. W. Goodwin and E. B. Van Keuern, Cons. Engrs. and Archts., Courtland; previously with Alabama Highway Dept. in various capacities, finally as Office Engr.

Thomas, Edward Harper, Tacoma, Wash. (Age 36) (Claims RCA 3.6 RCM 3.8) July 1930 to date with State of Washington, until Jan. 1939 in various capacities for Dept. of Highways, and since Jan. 1939 Bridge Designer for Toll Bridge Authority (except 4 months with Dept. of Highways in same capacity).

Udell, Harold, Dracut, Mass. (Age 31) (Claims RCA 5.3) Nov. 1941 to date Asst. Public Health Engr., U.S. Public Health Engr.; previously Engr., Town of Dracut, Mass.

Underwood, Joel Curry, Washington, D.C. (Age 55) (Claims RCA 1.2) Jan. 1942 to date Associate Engr. (Civ.), CEC, U.S. Navy Dept., Bureau of Yards and Docks; previously Chf. Draftsman, Bureau of Chemistry and Eng., U.S. Dept. of Agriculture; with Georgia Power Co., Atanta, in various capacities.

Van Reuth, Arthur Geatty, Baltimore, Md. (Age 30) (Claims RCA 6.6) Aug. 1935 to April 1937 Draftsman and April 1937 to date Asst. Engr., Baltimore (Md.) Transit Co.

Williams, Hanen Harris, Colorado Springs, Colo. (Age 34) (Claims RC 7.4 D 1.9) June 1942 to date Chf. Surveyor, Crocker & Ryan, Archt.-Engrs.; previously Chf. of Party, W. A. Bechtel Co., Miami, Ariz.; Structural Draftsman and Engr. with Mark Falk, Cons. Engr., Los Angeles; Land Surveyor, Albuquerque, N.Mex.; Jun. Road Engr. and Road Engr., U.S. Indian Service.

Zegarra, Edmund Joseph, Inglewood, Calif. (Age 36) (Claims RCA 3.0) Oct. 1942 to date Tech. Engr., Douglas Aircraft Co., Inc., Eng. Dept., El Segundo, Calif.; previously Engr. with R. V. Labarre, Foundation Engr., Los Angeles; Research Asst., Joint Highway Research Project, Purdue Univ., Lafayette, Ind., also (intermittently) Asst. to Dr. P. C. Rutledge; Jun. Engr., Cerro de Pasco (Peru) Copper Corporation.

Ziegler, Amos Addis, Jr. (Junior), Kew Gardens, N.Y. (Age 28) (Claims RCA 2.5) June 1937 to April 1940 Structural Draftsman, and April 1940 to date Designing and Estimating Engr., American Bridge Co., New York City.

APPLYING FOR AFFILIATE

Berger, Louis Herman, Boston, Mass. (Age 63) (Claims RC 20.0) 1922 to date Pres., C. L. Berger & Sons, Inc.

APPLYING FOR JUNIOR

Athens, Nicholas, Gary, Ind. (Age 25) March 1942 to date Detailer, Arthur G. McKee & Co., East Chicago, Ind.; previously Draftsman, successively with Bates & Rogers Constr. Corporation, Laporte, Ind., Joe H. Wildermuth, Archt., Gary, Ind., and Giffels & Vallet, Inc., Detroit, Mich.

Campbell, William Joseph, Knoxville, Tenn. (Age 25) Sept. 1942 to date Jun. Office Engr., Chf. Engr.'s Office, TVA; previously Student Engr., Illinois Bell Telephone Co.

Davenport, Donald Ames, Freeport, Tex. (Age 26) (Claims RCA 3.1 RCM 1.3) Jan. 1936 to date with Stone & Webster Eng. Corporation, as Concrete Draftsman and Designer, Field Engr., Instrumentman, Concrete Designer and Draftsman, and (since March 1941) Office Engr.

Li, Robert Ki-Cheong, Newton, Mass. (Age 24) Dec. 1941 to date Designing Draftsman, Stone & Webster Eng. Corporation.

Wafler, William, Wichita, Kans. (Age 27) March 1942 to date Draftsman, Boeing Airplane Company, Wichita; previously Chairman and Jun. Engr., Kansas Highway Comm., Topeka.

Wiggins, Donald Covey, Brentwood, Pa. (Age 28) (Claims RCA 3.4) At present with U.S. Navy at Reserve Midshipman Training School, Notre Dame, Ind.; Nov. 1940 to Feb. 1943 Development Engr., Carnegie-Illinois Steel Corporation.

Wilson, James Malcolm, Overland Park, Kans. (Age 29) Aug. 1938 to date with Black and Veatch, Cons. Engrs., Kansas City, Mo., as Inspector, Designer, Chf. Draftsman, and (at present) Designer-Draftsman.

1942 GRADUATES

CARNEGIE INST. TECH.

(B.S.)

	Age
Carver, Carl Franklin, Jr.	(21)
Holden, James Tolman	(22)
Kruszewski, Edwin Thomas	(22)
Linder, Robert Earl	(21)
Sadler, Harry M., Jr.	(23)

UNIV. OF KANS.

(B.S. in C.E.)

	Age
Boynton, Jerald H.	(23)

UNIV. OF MINN.

(B.C.E.)

Knieff, Henry Arthur	(26)

PURDUE UNIV.

(B.S.C.E.)

Olson, Robert Howard	(21)

SO. METHODIST UNIV.

(B.S. in Civ. Eng.)

Cullum, George Pierce, Jr.	(24)

TEX. A.&M. COLL.

(B.S.)

Race, George Woodrow	(24)

UNIV. OF WASH.

(B.S. in C.E.)

Murphy, William James, Jr.	(23)

1943 GRADUATES

COLUMBIA UNIV.

(B.S.)

Lewis, John MacDonald	(23)

GEORGIA SCHOOL TECH.

(B.S. in C.E.)

Bernstein, Bertram Philip	(21)
Chastain, Theron Zolly	(22)
Toppen, Theodore Samuel	(30)
Zagarella, Anthony	(20)

UNIV. OF IDAHO

(B.S.C.E.)

Fanning, John Glen	(28)

MISSISSIPPI STATE COLL.

(B.S.)

Felder, Charles Edwin	(22)

MO. SCHOOL OF MINES & MET.

(B.S. in C.E.)

DeValve, Albert Stiehler	(22)
Hoffmann, William George	(21)
Kasten, Raymond Oliver	(25)
Landis, Bruce Randolph	(20)
Magee, Horace Little, III	(21)
Meyer, Orville Leslie	(23)
Studebaker, Donald Jay	(20)
Weis, Carl Julius	(21)

RHODE ISLAND STATE COLL.

(B.S.C.E.)

D'Angelo, Joseph	(22)
Withey, William Henry	(22)

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MEN AVAILABLE

GRADUATE CIVIL ENGINEER; Jun. Am. Soc. C.E.; 9 years' varied professional experience: Surveying, including precise leveling with Coast and Geodetic Survey; mechanical maintenance; administration; construction; and $1\frac{1}{2}$ years assistant superintendent of dredging and marine drilling and blasting rock. Desires permanent position with future. Married. Location immaterial. C-960.

STRUCTURAL ENGINEER; Jun. Am. Soc. C.E.; B.S.C.E.; 29; studying business management. Experienced in design of concrete, wood, and steel. Progressed from steel detailer through draftsman and designer to engineer. Power houses, oil refineries, industrial buildings, docks, and miscellaneous structures. Desires position with firm that recognizes ability and is willing to train men in administrative capacity. Location immaterial. C-961.

CONTRACTOR'S ENGINEER; Assoc. M. Am. Soc. C.E.; 30 years' wide experience in building and general construction, including expediting, purchasing, negotiating, and estimating. C-962.

GRADUATE CIVIL ENGINEER; Jun. Am Soc. C.E.; 5 years' diversified experience in sewerage, sewage disposal, water systems, grading; drainage, roads, railroads, surveying, and concrete; drafting, design, estimating, and construction in field and office. Desires position where he may further his municipal or concrete design experience. C-963.

EXECUTIVE ENGINEER; M. Am. Soc. C.E.; 45; B.S.C.E., Cornell University; native American; member of leading technical societies; over 20 years' broad construction experience in transport, utility, and industrial work. Proved ability as construction manager and job organizer on large work, both domestic and foreign; also experienced in developing new work and negotiating new contracts. At present chief engineer for well-known concern doing large amount of government work from coast to coast. C-964.

GENERAL SUPERINTENDENT OR CHIEF ENGINEER; Assoc. M. Am. Soc. C.E.; U.S. citizen; graduate civil engineer; over 25 years' experience in responsible directive capacities on work of magnitude here and abroad, inclusive of tropical countries. Accustomed to both design and construction. Organized and executed projects of difficult varied construction for both governmental and private interests. Work included most all lines. Record of accomplishment. C-965.

CIVIL ENGINEER; Assoc. M. Am. Soc. C.E.; 34; 12 years' experience in private practice on design and construction of water and sewerage works, including supply and treatment. Past 2 years in charge of design, specifications, and construction of utilities, including airfield grading, drainage, and paving on Army air bases and cantonments. C-966.

GRADUATE ENGINEER; Assoc. M. Am. Soc. C.E.; 15 years' experience with general contractor on office building and hospital construction. Now employed in maintenance department of large institution as chief engineer's assistant and cost accountant. Wishes to return to construction work with contractor, architect, or bank, where building experience would be used. C-967.

POSITIONS AVAILABLE

STRUCTURAL DESIGNER AND DRAFTSMAN. Headquarters, New York, N.Y. Y-9927.

COMMISSIONS IN THE U.S. ARMY. Civil, Chemiical, or Sanitary Engineers, 18–45, with minimum of 4 years' experience in sanitary engineering or public health—either mosquito control, sewerage, or water supply. Must be a resident of New York, New Jersey, or Delaware. Headquarters, New York, N.Y. W-1653.

CIVIL ENGINEERS, over 40, not necessarily graduates, with good ground work in fundamentals of structures. Should have had some experience or training in theory of structures, steel design—such as, buildings, bridges, reinforced concrete, stress analysis, hydraulics, sheet metals, strength of materials, architectural design and drafting, and other structural work. Prefer men who have had 3 to 5 years' experience and who are of mature age. Will be in the aeronautical industry. Permanent. Write to the Engineering Societies Personnel Service, Inc., for application blanks. Location, East. W-1690.

SAFETY ENGINEER, graduate. Should have had experience in heavy industry for large shipyard employing 10,000 employees. Salary, $3,600–$4,800 a year. Location, South. W-1698.

CONCRETE ENGINEER. Must have had previous experience as such on a very large construction job as company hopes to pour 3,000 to 5,000 cu yd a day. Must understand perfectly control of mixes and design of mixes and be able to coordinate entire pouring schedules. Salary, $7,500-$9,000 a year. W-1738.

INSTRUCTOR OR ASSISTANT PROFESSOR in civil engineering; preferably man qualified to teach work in the sanitary field, surveying, and one or two courses in structures. Salary, $1,800 for an instructor; $2,500 a year for an assistant professor. Location, New England. W-1744.

ARCHITECTURAL AND STRUCTURAL DRAFTSMEN AND ENGINEERS capable of doing ship work. Salaries, $2,600–$3,800 a year for a 40-hour week, plus time and a half for overtime. Location, Maryland. W-1817.

SANITARY OR CIVIL ENGINEERS to make routine inspections of water supplies, supervise their operation, and make suggestions for improving their efficiency. Prefer general water works experience. Location, Georgia. W-1819.

CIVIL ENGINEER, 45–60, for office engineering work, outlining advance construction work and materials, some layout work, specification and contract experience desirable. Any shipyard construction experience would be especially helpful. Fairly permanent for the duration. Salary, $20 per diem. Location, Washington, D.C. W-1821.

SUPERINTENDENTS OR MANAGERS of concrete pipe manufacturing plants. Salary, minimum of $2,600 a year. Locations, northern New Jersey, Philadelphia, Washington, D.C., and Virginia. Headquarters, New Jersey. W-1831.

ENGINEERS, young, with water works experience. Salaries, $3,600–$4,600 a year. Location, Washington, D.C. W-1847.

RECENT BOOKS

New books of interest to Civil Engineers donated by the publishers and filed in the Engineering Societies Library, or in the Society's Reading Room, will be found listed here. The notes regarding the books are taken from the books themselves and are edited by members of the staff of the Society or of the Library. Those books which are in the Library may be borrowed by mail by Society members for a small handling charge.

ANNUAL REPORT ON THE PROGRESS OF RUBBER TECHNOLOGY, Vol. 5, 1941. Published by W. Heffer & Sons Ltd., Cambridge, England, for the Institution of the Rubber Industry, 12 Whitehall, London, S.W. 1, 1942. 145 pp., $9\frac{1}{2} \times 7\frac{1}{2}$ in., paper, 10s. 6d. to non-members (2s. 6d. to members).

These annual reports by groups of experts afford a convenient means for keeping abreast of developments in the field of rubber. Every aspect of the cultivation, properties, and uses of rubber is discussed, and each report is accompanied by an extensive bibliography. A name index is also provided.

CONCRETE MANUAL, 4 ed. U.S. Department of the Interior, Bureau of Reclamation, Washington, D.C., 1942. 476 pp., illus., diagrs., charts, tables, $7\frac{1}{2} \times 4\frac{1}{2}$ in., fabrikoid, $1 (lots of 40 copies or more subject to 25% discount).

The new edition of this well-known manual differs little from the third, but errors have been corrected and the text altered to represent the current practice of the Bureau of Reclamation. The subjects discussed include the properties of concrete and the factors that control them, the investigation and selection of concrete materials, concrete mixes, inspection and testing, concrete manufacturing, handling, placing and survey, and special types of concrete.

DIFFERENTIAL EQUATIONS. By R. P. Agnew. McGraw-Hill Book Co., New York and London, 1942. 341 pp., diagrs., charts, tables, $9\frac{1}{2} \times 6$ in., cloth, $3.

Offers a first course in the subject for those with a working knowledge of algebra, trigonometry, and elementary calculus. Is intended to give a mastery of the techniques by which differential equations are obtained and solved, and by which the solutions are applied.

MANUAL OF EXPLOSIVES, MILITARY PYROTECHNICS AND CHEMICAL WARFARE AGENTS, By J. Bebie. The Macmillan Co., New York, 1943. 171 pp., diagrs., tables, $8\frac{1}{2} \times 5\frac{1}{2}$ in., cloth, $2.50.

This manual is a convenient source of information on the composition, properties, and uses of explosives and war chemicals. The articles are arranged in alphabetical order, with cross references to service symbols, trade names, and other synonyms. Composition, properties, and uses are stated concisely. There is a bibliography.

PLASTICS CATALOG, 1943, an Encyclopedia of the Plastics Industries. Plastics Catalogue Corporation, New York (122 East 42nd St.); also Chicago (221 N. La Salle St.). 864 pp., illus., diagrs., charts, tables, $12\frac{1}{2} \times 9$ in., fabrikoid, $5.

This large volume will be found most useful by all users of plastics. A combination of technical encyclopedia and trade directory, it contains authoritative articles on properties of the various plastics, on plasticizers and solvents, on manufacture, machinery, molding, fabricating, laminates, coatings, synthetic fiber, synthetic rubber etc. The directory section covers the manufacturers of plant equipment, and includes a bibliography, a glossary, an index of molders' marks, and a complete list of makers.

STRESSES IN FRAMED STRUCTURES, 2 ed. Edited by G. A. Hool and W. S. Kinne, revised by R. R. Zipprodt and G. C. Ernst. McGraw-Hill Book Co., New York and London, 1942. 642 pp., diagrs., charts, tables, $9\frac{1}{2} \times 6$ in., cloth, $5.

The first edition of this reference book on the stresses in framed structures appeared twenty years ago and has been widely used. The present edition has been thoroughly revised to correspond with modern practice. The book covers the principles of statics, reactions, moments and shears in beams and trusses, influence lines, methods of computing stresses in roof and bridge trusses, determination of stresses in lateral trusses and portal bracing, etc.

TRAFFIC AND PARKING STUDY. A Plan for the Improvement of Conditions in the Central Business Areas of New York City. The Regional Plan Association, Inc., New York (400 Madison Avenue), 1942. 144 pp. (plus appendix of statistical tables), diagrs., charts, maps, $11 \times 8\frac{1}{2}$ in., cloth, $4.50.

This volume is the product of thorough research over a two-year period, under the direction of Harold M. Lewis. It is believed to be the most complete job of its kind ever done in this area, and the first one to incorporate such a comprehensive approach. The study treats traffic and parking as a single problem, and embraces all the composite elements of that problem in relation to the particular traffic and terminal needs of the core of the New York metropolitan region.

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CURRENT PERIODICAL LITERATURE

Abstracts of Articles on Civil Engineering Subjects from Publications (Except Those of the American Society of Civil Engineers) in this Country and Foreign Lands

Selected items for the current Civil Engineering Group of the Engineering Index Service, 29 West 39th Street, New York, N.Y. Every article indexed is on file in The Engineering Societies Library, one of the leading technical libraries of the world. Some 2,000 technical publications from 40 countries in 20 languages are received by the Library and are read, abstracted, and indexed by trained engineers. With the information given in the items which follow, you may obtain the articles from your own file, from your local library, direct from the publisher, or they may be borrowed from The Engineering Societies Library. Photoprints will be supplied by this library at the cost of reproduction, 25 cents per page to members of the Founder Societies (30 cents to all others), plus postage, or technical translations of the complete text may be obtained at cost.

BRIDGES

Concrete. Minimizing Use of Critical Materials by Concrete Bridge and Culvert Construction. *Pub. Works*, vol. 74, no. 1, Jan. 1943, pp. 32, 34, and 36–37. Specific examples of what has been done in repairing and replacing bridges and culverts to make them adequate for heavy wartime traffic; use of continuous girder bridges and plain concrete culverts.

Demolition. Demolition of Tacoma Narrows Bridge Cables and Towers, C. E. Andrew. *Pacific Bldr. & Engr.*, vol. 49, no. 1, Jan. 1943, pp. 32–33. Unique operation in engineering involved designing of special machines and equipment to unwind wire in two main cables and bring down 420-ft steel towers; most of salvaged material to go into war effort and will total about 3,900 tons of wire and 3,800 tons of structural steel.

Footbridges. Rigid-Frame Footbridge Replaces Suspension Type Over Moira River at Belleville, Ont., C. A. Mott. *Roads and Bridges*, vol. 81, no. 1, Jan. 1943, pp. 23–24, 52, 54, and 56. Details pertaining to construction of two-span concrete footbridge with one pier in center of river.

Highway, Great Britain. Recent Highway Bridge Practice in Great Britain, C. S. Chettoe. *Assn. Internationale des Ponts et Charpentes—Memoires*, vol. 5, 1937–1938, pp. 91–101. Author refers to 5,000 highway bridges constructed and widened in Great Britain during last 10 years and considers examples under headings: new bridge work in steel; new bridge work in reinforced concrete; widening and strengthening of existing bridges. (Brief abstracts in German and French.)

Iron and Steel Scrap. Blow Old L. & N. Bridge Span Into Nation's Scrap Pile. *Ry. Age*, vol. 114, no. 4, Jan. 23, 1943, pp. 244–245. Article explains how army, with 200 lb of rapid-burning dynamite, demolished 268-ft steel span across Kentucky River at Irvine, Ky., making available 372,000 lb of steel for nation's scrap pile.

Ponton. Army "Shipyard" Builds Wood Pontons for Floating Bridges to Serve Washington's Wartime Traffic. *Construction Methods*, vol. 24, no. 12, Dec. 1942, pp. 46–47 and 112–113. Illustrated notes on building and launching of 96 wood pontons, each 65 ft long and 12 ft wide, to serve as floating supports for 4 emergency bridges carrying traffic across Potomac and Anacostia rivers.

Railroad. Raise Long Bridge Under Traffic to Clear Flood Waters. *Ry. Age*, vol. 114, no. 3, Jan. 16, 1943, pp. 202–205. Description of unusual procedure followed in jacking up 1,800-ft truss and girder structure of 9 spans, including one 267-ft span, which were menaced by high water.

Steel Arch, Tie Girder. Bridge on Chesapeake and Delaware Canal. *Engineer*, vol. 174, nos. 4527, and 4528, Oct. 16, 1942, pp. 314–316, and Oct. 23, pp. 333–334. Illustrated description; main span, which has length of 540 ft, is of tied-arch type originally attributed to Langer, Austrian engineer; north and south approaches to tied-arch span are plate-girder spans.

Wooden. Designing and Constructing Creosoted Timber Bridges and Culverts, W. D. Keeney. *Pub. Works*, vol. 74, no. 1, Jan. 1943, pp. 18–24, and 37–38. Detailed information on how timber can be and is being used for structures up to and over 200-ft span; trestles, trusses, and decks, both plain and composite; preframing and construction.

BUILDINGS

Air-Raid Precautions, Shelters. Special Air Raid Shelters, H. F. Doeleman. *Baltimore Engr.*, vol. 17, no. 5, Nov. 1942, pp. 8–11. Discussion of shelter designs classified as follows: Domestic outdoor special shelter; basement shelter; shelter areas in buildings now in course of design.

CITY AND REGIONAL PLANNING

Expressways and Parkways, Buenos Aires, Argentina. General Paz Avenue, Buenos Aires. *Engineer*, vol. 174, no. 4529, Oct. 30, 1942, p. 367. Brief illustrated description of modern motor road which makes half circle around city through outer suburbs; length 25 km.

Post-War. Engineer and Post-War Reconstruction. *Engineer*, vol. 174, no. 4527, Oct. 16, 1942, p. 323. Brief report on second conference arranged by Institution of Civil Engineers to deal with details of post-war planning as it affects engineer.

Post-War. Post-War Planning and Reconstruction: Immediate Development, C. R. Hutchinson. *Surveyor*, vol. 101, no. 2653, Nov. 27, 1942, pp. 409–410. Review of factors which author claims will necessitate short-term policy of reconstruction before broader issues can be undertaken; suggestions for post-war housing and drainage; changes in location of industries.

Post-War. Replanning London. *Engineer*, vol. 174, no. 4528, Oct. 23, 1942, pp. 341–342. Reference to exhibition dealing with planning of London for rebuilding after war; grand skeleton of plan revealed by exhibition consists of ring road around inner London and removal from within that ring of all above-ground railways.

São Paulo, Brazil. São Paulo Rebuilds to Plan, F. J. Violich. *Am. City*, vol. 58, no. 1, Jan. 1943, pp. 62–64. São Paulo's program of modernization and reorganization of civic facilities into efficient and attractive scheme.

CIVIL ENGINEERING

Engineering Geology. Development and Use of Engineering Geology, F. A. Nickell. *Am. Assn Petroleum Geologists—Bul.*, vol. 26, no. 12, Dec. 1942, pp. 1797–1826. In study of new projects, engineer is forced to consider effect of natural conditions on costs and ultimate success of construction; engineering geologist is primarily concerned with occurrence and physical character of rocks, ordinarily at relatively shallow depths; obtaining of necessary information revolves more around questions of feasibility and security than matters of economic justification; outline of problems in investigation and construction of dams. Bibliography.

CONCRETE

Arches. Unreinforced Concrete Arches, C. R. Ruminer. *Roads & Streets*, vol. 85, no. 12, Dec. 1942, pp. 27–28. Indiana example demonstrates advantages of this type when steel is scarce; details of unreinforced concrete arch bridge with span of 65 ft, rise of 14 ft, and clear roadway of 28 ft, under construction on Indiana State Road No. 75, north of Frankfort.

Products, Blocks. Gearing Plant for War Business. *Rock Products*, vol. 45, no. 12, Dec. 1942, pp. 100 and 102. Cinder Concrete Products, Inc., of Denver, Colo., increases capacity with new block machine, and improves method of handling aggregates and cured products.

Products, Blocks. Slag Aggregates for Concrete Block, B. Nordberg. *Rock Products*, vol. 45, no. 12, Dec. 1942, pp. 96–97 and 99. Concrete products plants of Birmingham Slag Company at Ensley and at Alabama City, Ala., supply large war projects in several states with rail and truck haul.

ROADS AND STREET

Airport Runways. Air Depot Built Under Adverse Sub-Surface Conditions, W. A. Averill. *Pacific Bldr. & Engr.*, vol. 48, no. 12, Dec. 1942, pp. 30–34. Military expediency influenced selection of site that otherwise might not have been considered; one runway replaces two shallow lakes by use of ingenious drainage system; operations thoroughly mechanized; how Seattle District, U.S. Engineer Department, and contractors carried out this work.

Airports, Design. Establishing Grades on Airfields, B. J. Lambert. *Eng. News-Rec.*, vol. 129, no. 23, Dec. 3, 1942, pp. 786–789. Method for preparing isometric grade chart is proposed for use in selecting grade for airfield; computations are reduced to minimum, and adjustments to save excavation can be made largely on basis of visible inspection of chart; field methods for laying out runway intersections by same system are given.

Concrete. Wartime Construction of Concrete Pavements. *Pub. Works*, vol. 73, no. 12, Dec. 1942, pp. 17–20. Modifications of proportions and details recommended by Highway Research Board and Portland Cement Assn. to minimize use of steel and other critical materials; designing concrete pavement; calculating pavement thickness; curing pavements; details of four designs, showing street intersections, given in diagram.

Construction. Importance of Highway Construction in Post-War Rehabilitation Plans, R. C. Wallace. *Eng. & Contract. Rec.*, vol. 55, no. 49, Dec. 9, 1942, pp. 14–16. Discussion of reestablishing of Canadian economy in period of dislocation that will inevitably follow end of war; public works projects; responsibility of forest roads; highway planning now. Before Can. Good Roads Assn.

Construction. New Developments in Field of Highway Construction, J. G. Schaub. *Concrete*, vol. 50, no. 11, Nov. 1942, pp. 33–34. Review presented of developments in highway construction field and of effect of war production on some of these developments; compaction of earth; shoulder construction; concrete pavement sections; cotton mats replace burlap; highway design.

Curves. Vertical Curves for Highways, D. W. Loutzenheiser. *Pub. Roads*, vol. 23, no. 5, July, August, September 1942, pp. 89–94. Length of vertical curves; calculations of elevations on vertical curves; length of vertical curve to pass through point of known elevation; tabular data; nomograph for calculation of elevation of point on parabolic vertical curve given.

Flight Strips. Design and Construction of Flight Strips, F. Schnepfe. *Roads & Streets*, vol. 85, no. 11, Nov. 1942, pp. 64–66. Site selection is of primary importance, and since every site has its limitations, thorough investigation and good judgment are necessary to evaluate advantages and disadvantages of location; geometric design; structural design; impact; drainage; shoulders; fences; construction methods; construction of pavement. Before Am. Soc. Civ. Engrs.

Guard Rails. Wartime Design of Highway Guard. *Better Roads*, vol. 12, no. 11, Nov. 1942, pp. 23–24, 34 and 36. Lack of critical materials alters practice for war period; mounded earth, timber, masonry, and boulders offer possibilities. Article is based on material in bulletin on wartime road problems issued by Highway Research Board.

Highway Engineering, Wartime. Roads Under War Restrictions—IV. *Eng. News-Rec.*, vol. 129, no. 25, Dec. 17, 1942, pp. 847–850. How Arkansas, Texas, and California highway departments are meeting problems raised by war restrictions; Texas abandons work temporarily; manpower shortage in Arkansas; California's fourfold problems.

Highway Systems, Alaska-Canada. Alcan—America's Glory Road, H. W. Richardson. *Eng. News-Rec.*, vol. 129, no. 25, Dec. 17, 1942, pp. 858–872. Illustrations and general description of construction of 1,800-mile highway from Dawson Creek, B.C., to Gulkana and Fairbanks, Alaska.

Highway Systems, Wisconsin. Wisconsin's Unique Plan, J. Wyngaard. *Better Roads*, vol.

12, no. 10, Oct. 1942, pp. 13–14 and 24. County highway organizations maintain 10,000-mile system of state trunk lines; local influence is strong in determination of trunk-line improvement policy.

Iran. Construction of Low-Cost Roads in Southwest Iran, S. W. F. Morum. *Instn. Civ. Engrs.—J.*, vol. 19, no. 1, Nov. 1942, pp. 21–37. Account of work carried out in Iran by Anglo-Iranian Oil Company to develop and construct temporary roads to cover erection of specific unit and cater to light traffic conditions; also desert roads for moderate to light traffic.

Maintenance and Repair. ABC's of Road Maintenance with Tars. *Eng. News-Rec.*, vol. 129, no. 23, Dec. 3, 1942, pp. 781–785. As road tars can be obtained in limited quantities to replace asphaltic products, characteristics of such tars are given to guide those not familiar with their use; in states where tars have been used much has been done in recent years to standardize products put out by producers and to improve methods of use; these standards are summarized in tabular form and methods of application are outlined.

Soil Cement. Soil Cement Pavements, D. V. Darwin. *Commonwealth Engr.*, vol. 30, no. 3, Oct. 1, 1942, pp. 53–55. History of low-cost pavements in Victoria; results of soil-cement experiments carried out by Country Roads Board; advantages and disadvantages of soil cement pointed out; plant required.

Soil Cement. Cement Stabilised Soil Road Pavement at Warracknabeal, F. West. *Commonwealth Engr.*, vol. 30, no. 3, Oct. 1, 1942, pp. 56–59. In May 1941 Victorian Country Roads Board constructed two short sections of road pavement on Henty Highway, 4 miles south of Warracknabeal, by soil-cement stabilization process; notes on design, plant, construction technique, behavior under traffic, bituminous surface treatment, and record of laboratory tests.

Surface Dressings. Surface Dressed Traffic Lines. *Roads & Road Construction*, vol. 20, no. 235, July 1, 1942, pp. 147–152. In search for alternative methods of producing white lines, attention has been given at Road Research Laboratory to possibilities of "surface dressed" lines consisting of white or light-colored chippings held to road surface by tar or bitumen method successfully used to limited extent in United States and tentative trials made in Great Britain; laboratory's efforts directed mainly to studying technique of process in relation to conductions in Great Britain, and developing machinery.

SANITARY ENGINEERING

Wartime. First-Aid for Sanitation Needs. *Eng. News-Rec.*, vol. 129, no. 23, Dec. 3, 1942, pp. 775–776. Federal funds provided by Lanham act ($300,000,000) for extension of community facilities in war-expanded areas are widely applicable to emergency sanitation needs; simplified explanation, in form of questions and answers, has been prepared by Sanitation Section of U.S. Pub. Health Service; designed primarily to aid its district office in rendering assistance for further development of program, questionnaire contains useful information for state and municipal authorities.

War Conditions. Municipal Sanitation Under War Conditions. *U.S. Office Civilian Defense—Medical Div. Sanitary Eng.—Bul. No. 2*, Sept. 1942, 26 pp. Problems presented and plans suggested to meet emergencies in local community concerning sewerage and sewage disposal, municipal waste collection and disposal, and plant protection.

SEWERAGE AND SEWAGE DISPOSAL

Aeration. About Pre-Aeration, H. W. Taylor. *Am. City*, vol. 57, no. 11, Nov. 1942, p. 67. Preaeration releases free gases, encourages flotation, and may aid coagulation; its use depends on local sewage characteristics and local requirements.

Biochemical Oxygen Demand. Effect of River Mud Deposits on Determination of B.O.D. of Supernatant Liquor, W. A. Moore and C. C. Ruchhoft. *Indus. & Eng. Chem. (Analytical Edition)*, vol. 14, no. 12, Dec. 1942, pp. 933–934. In investigation made in earlier paper (see *Engineering Index*, 1941, p. 1080), it was found that presence of river mud in suspension caused discrepancy in dissolved oxygen and B.O.D. results, attributed to presence of highly reducing substances in muds; present paper indicates effect of anaerobic mud deposits upon B.O.D. of supernatant liquor, and shows that discrepancy in B.O.D. as determined by two methods varies with time during which supernatant liquor is in contact with deposits.

Biological Treatment. Some Recent Developments in Biological Treatment of Settled Sewage, M. Lovett. *Surveyor*, vol. 101, no. 2649, Oct. 30, 1942, pp. 371–373. Discussion of aerobic decomposition of sewage by biological contact processes; more unusual features of process dealt with; contact beds; filters and filtration.

Chlorination. Chlorine in Sewage Treatment, A. E. Griffin. *Water & Sewage*, vol. 80, no. 11, Nov. 1942, pp. 30–31, 48, 50, 52, 54, and 56. Most important property of chlorine in re-

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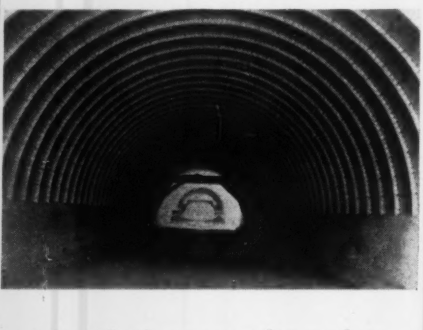

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lation to sewage is its ability to kill bacteria; it reacts chemically with many other constituents; composition of sewage; upstream treatment; chlorination at plant; effluents and chlorination; potential chlorination. Before Can. Inst. Sewage & Sanitation.

DISPOSAL PLANTS, COLORADO. Sewage Treatment Plant for Home for Mental Defectives, B. V. Howe. *Pub. Works*, vol. 73, no. 12, Dec. 1942, pp. 22–23 and 42. Plant, installed in Colorado's State Home and Training School for Mental Defectives, consisting of Imhoff tank and trickling filter, contains several small details, which are described and illustrated.

DISPOSAL PLANTS, GREAT BRITAIN. Some Structural Work in Connection with Swansea Main Drainage Scheme, K. G. Griffiths. *Structural Engr.*, vol. 20, no. 6, June 1942, pp. 77–85. Description of main sewage works of county of Borough of Swansea, also largest of pumping stations situated in central portion of town. Before S. Wales and Monmouthshire Branch of Instn. Structural Engrs.

DISPOSAL PLANTS, MAINTENANCE AND REPAIR. Sewage Plant Maintenance, S. J. Larsen. *Water Works & Sewerage*, vol. 89, no. 11, Nov. 1942, pp. 457–464. Some experiences and practices developed at Sewage Treatment Plant of Minneapolis-St. Paul Sanitary District, Minnesota.

SLUDGE DISPOSAL, CHICAGO. Sludge Drying and Fertilizer Production at Chicago Calumet, L. M. Johnson. *Sewage Works Eng. & Mun. Sanitation*, vol. 13, no. 2, Feb. 1942, pp. 67–71. Calumet Sewage Treatment Works of Sanitary District of Chicago serves area of 95 sq miles; works utilizes activated sludge process and was designed for average flow of 136 mgd; sludge is disposed of by heat drying, and dried sludge may be incinerated or sold as fertilizer material; odorless drying; ferric chloride coagulation; filter cloth life is 1,500 hours; grit aids filtration; fertilizer produced; operating costs; flow diagram.

TORONTO. Operating Results at North Toronto Sewage Treatment Plant, N. G. McDonald. *Water & Sewage*, vol. 80, no. 11, Nov. 1942, pp. 32–33, 58, 60, and 62–63. Plant details; loading of plant; aeration system; returned sludge; digestion process; bacteria reduction. Before Can. Inst. Sewage & Sanitation.

WARTIME NEEDS, CHEEKTOWAGA, N.Y. Peacetime Treatment Plant for War Production Industries, E. Mesner and N. L. Nussbaumer. *Sewage Works Eng. & Mun. Sanitation*, vol. 13, no. 12, Dec. 1942, pp. 600–604. Details pertaining to Cheektowaga, N.Y., Sewage Treatment Plant, which has been converted to war service; pumphouse; primary sedimentation; trickling filters and final sedimentation; chlorination; digestion; sludge drying.

STRUCTURAL ENGINEERING

FRAMED STRUCTURES, WOODEN. Designing Rigid Frames of Timber. J. J. Polivka. *Eng. News-Rec.*, vol. 129, no. 23, Dec. 13, 1942, pp. 790–793. Large lumber savings are possible by using rigid frames for timber buildings; tables to permit rapid design of such members are made available, and typical problem is analyzed step by step, including design of joints.

HANGARS, CONSTRUCTION. Blimp Hangars Built by Contrasting Methods. *Eng. News-Rec.*, vol. 129, no. 25, Dec. 17, 1942, pp. 841–846. Duplicate blimp hangars for Navy, framed with large number of 328-ft span steel-arch trusses, were erected by two different procedures; in one, single large tower served as both falsework and derrick support, while in other derrick towers and false-work towers were separate; sequence of door and hangar arch erection was also different on two jobs.

STRESSES. Graphical Analysis of Stresses in Three-Dimensional Loading, C. R. Freberg and E. N. Kemler. *Product. Eng.*, vol. 13, no. 12, Dec. 1942, pp. 714–717. In 2- and 3-dimensional stress problems with elastic bodies there are two different types of loading, which make difference in allowable loads; charts based on distortion energy theory of failure are presented; with these it is possible to apply values of stresses in different directions readily and to obtain resultant stress in terms of percentage of elastic limit; charts also enable simple calculation of factor of safety.

TRUSSES, WOODEN. Timber Bowstring Trusses Supported on Buttressed Concrete Columns. *Eng. News-Rec.*, vol. 129, no. 23, Dec. 3, 1942, pp. 771–774. Bowstring timber arch trusses of 160- and 75-ft spans are set on high, buttressed concrete columns to support roof for hangar; top chords of arches are two parallel stacks of small members, bent to roof radius, glued and spiked together; bottom chord is pair of heavy timbers, spliced for tension; ends of hangar are inclosed in sliding door for full 160-ft spans; doors are built in 8 sections, each section sliding into side pockets.

TRAFFIC CONTROL

REFLECTORS. Reflectorized Guide Posts Help Driving on Wyoming Highways, C. W. Beaver. *Roads & Streets*, vol. 85, no. 11, Nov. 1942, pp. 39–40. Design of roadway section developed by

Wyoming State Highway Department Engineers, which has overcome snow drifting on road bed; to facilitate driving through periods of poor visibility, experimental sections using reflectorized guide posts to delineate shoulders of roadway installed on U.S. Route 30 over Sherman Hill between Cheyenne and Laramie.

TUNNELS

Mines and Mining. Driving Methods at Myrtle Group, Island Mountain Mines Company, Limited, E. E. Mason. *Can. Min. & Met.—Bul. 367*, Nov. 1942, pp. 533–539. On Barkerville mountain in Cariboo mining district of British Columbia, 1,800-ft adit was driven in 1935–1936; it was proposed to enlarge this adit to more convenient section, extend it 2,500 ft into Myrtle gound, and from there drive main entry 3,000 ft along length of group; details of crew organization, drilling and blasting, muck handling, costs, etc.

Railroad, Lining. Denver & Salt Lake Seeks Greatest Security Through Long-Time Tunnel Lining Program. *Ry. Eng. & Maintenance*, vol. 38, no. 10, Oct. 1942, pp. 692–695. Details of program under way on this road; specific methods and gang organizations being employed.

Railroad, Lining. No Delays to War Traffic on This Tunnel Repair Job. *Ry. Age*, vol. 113, no. 23, Dec. 5, 1942, pp. 910–912 and 918. How Pittsburgh & West Virginia Railroad solved problem of restoring 300-ft failure in section of concrete lining of important double-track main-line tunnel by installing liner plates.

Vehicular, Colorado. Canyon Highway Tunnel, T. L. Wells. *Explosive Engr.*, vol. 20, no. 11, Nov. 1942, pp. 332–334. Tunneled sections facilitate construction of first roadway up historic Clear Creek Canyon to shorten and improve strategic transcontinental route west of Denver, Col.; highway replaces part of transcontinental Route No. 40, reducing distance between Golden and Idaho Springs by 6 miles and eliminating dangerous grades and curves; blasting practice.

WATER PIPE LINES

Maintenance and Repair. Manual on Emergency Repairs to Water Distribution Systems. *Am. Water Works Assn.—J.*, vol. 34, no. 12, Dec. 1942, pp. 1889–1913. Manual based on Bul. No. 3 of Emergency Water and Sewerage Committee of Indiana State Board of Health and Indiana Defense Council: valves; emergency materials; general pipe data; emergency repair equipment; sterilization of mains; personnel; repair procedure; fire hydrant by-pass connections; typical emergency repairs; adapting standard mechanical repair parts to emergency conditions for temporary repair; illustrations of equipment for emergency repairs of major main breaks. Bib.

WATER TREATMENT

Chlorination Control. Control of Chlorination. *Am. Water Works Assn.—J.*, vol. 34, no. 12, Dec. 1942, pp. 1782–1784. Committee progress report; work of committee is incomplete, particularly with respect to composition of permanent standards for use with orthotoluidine; proposed changes in present standard methods stated briefly.

Chlorination. Chlorine Residual and Bacteriological Quality, M. Levine, A. Heller and R. Bender. *Am. Water Works Assn.—J.*, vol. 34, no. 12, Dec. 1942, pp. 1787–1796. Problem of relation of chlorine residual to bacteriological quality of drinking water discussed; chlorine residuals by various methods; chlorine residuals and incidence of gas formers; effect of dechlorination and storage on incidence gas formers; types of non-spore-forming organisms surviving chlorination.

Chlorination. Maintenance of Chlorine Residual in Distribution System, C. R. Harvill, J. H. Morgan, C. Hagar and A. R. Todd. *Am. Water Works Assn.—J.*, vol. 34, no. 12, Dec. 1942, pp. 1797–1806. Discussion of maintenance of chlorine residuals in distribution systems at Houston, Tex., Boonville, Mo., and Wheeling, W. Va.

Filtration Plants, Design and Operation Data. Design and Operation Data on Large Rapid Sand Filtration Plants in U.S. and Canada, E. A. Hardin. *Am. Water Works Assn.—J.*, vol. 34, no. 12, Dec. 1942, pp. 1847–1879. Filtration plant information given, which should be generally useful in comparing plants, in determining standard American filter plant practice and possibly as guide to new design if due allowance is made for particular conditions met in each case; tabular data. Bibliography.

Plants, Auburn, N.Y. Auburn, N.Y., Effectively Treats Its Water at Slow Sand Filtration Plant, H. E. Milliken. *Water Works Eng.*, vol. 95, no. 25, Dec. 16, 1942, pp. 1495–1496. Details of Auburn, N.Y., filter plant; plant is comprised of four units of slow sand filters making total of 1.58 acres; demand on plant at present is from 7 to 8 mgd, which is its practical working capacity; no other treatment of water is used except chlorination for sterilization after filtration.

Saginaw, Mich. Treating Troublesome Water, N. N. Wolpert. *Water Works Eng.*, vol. 95, no. 24, Dec. 2, 1942, pp. 1436–1439. Operating results obtained at Saginaw, Mich., treatment plant; description of methods used.

Sewers, Design. Alignment Charts for Design of Sewers and Other Open Channels, F. Law. *Instn. Civ. Engrs.—J.*, vol. 19, No. 1, Nov. 1942, pp. 56–63, supp. plates. Adaptation of Manning formula to construction of alinement charts for open channel flow and sewers of special shape; variables for size and slope of channel, friction coefficient, velocity of flow, and discharge can be incorporated in simple alinement chart.

Water Analysis, Alkalinity. Slide Rule for Carbonate Equilibria and Alkalinity in Water, Supplies, A. A. Hirsch. *Indus. & Eng. Chem. (Analytical Edition)*, vol. 14, no. 12, Dec. 1942, pp. 943–946. Object of slide rule described is to provide mechanical solution to equations given, so that concentration of various carbonate and alkalinity species can be calculated expeditiously from total alkalinity and pH value; in most cases single setting of rule suffices to define carbonate and alkalinity distribution in water sample. Bibliography.

Wartime Control. Wartime Control of Water Quality, C. R. Cox. *Am. Water Works Assn.—J.*, vol. 34, no. 12, Dec. 1942, pp. 1755–1761. Modification of conventional treatment procedures; emergency disinfection of water mains; laboratory control of water purification process.

WATER WORKS ENGINEERING

Protection. Protection and Maintenance of Public Water Supplies Under War Conditions. *U.S. Office of Civilian Defense—Medical Div.—Sanitary Eng.—Bul. No. 1*, Sept. 1942, 34 pp. Purpose of this bulletin is to outline cooperative plan of mutual aid for waterworks, in some ways like that used by fire and police departments, to describe functions of participating officials and to suggest activities and specific measures to be considered by local waterworks to end that water service may be maintained during emergency.

Tanks and Towers, Welded Steel. Welded Steel Reservoir with Ellipsoidal Roof. *Engineering*, vol. 154, no. 4002, Sept. 25, 1942, p. 256. Illustrated description of 2,500,000-gal service reservoir built for City of Tulsa, Okla. Similar description previously indexed from *Eng. News-Rec.*, Apr. 23, 1942.

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ALUMINUM—Welding and Brazing. Gas, arc, and electric-resistance welding and furnace brazing, torch brazing and dip brazing of aluminum are covered in a 100-page book, recently released. Aluminum Co., Pittsburgh, Penna.

ARCHES AND BEAMS OF WOOD—This 12-page catalog illustrates the successful use of glued laminated construction over an eight-year period, in buildings covering an area of more than 5,000,000 sq ft. Practically every conceivable shape and type of arch and beam, and practically every basic type of installation is shown, with photographs, drawings, and suggestions for its practical application. Unit Structures, Inc., Peshtigo, Wis.

BUILDING STEEL—A catalog of the Stran-Steel members and shapes for various types of buildings has been published recently. Stran-Steel Division, Great Lakes Steel Co., Penobscot Bldg., Detroit, Mich.

EXPLOSIVES—A new publication details the use of explosives in forestry, lumbering, and agriculture. The usefulness of the book is not limited to these fields, as many of the problems discussed are met with on construction jobs and in Army demolition work. Atlas Powder Co., Wilmington, Del.

THE FOREST FIGHTS—Published by the Timber Engineering Company, Washington, D.C., is a book of news pictures showing the jobs the forest industries have done and are doing in the war effort. Chapters in this 48-page book show uncommon or revived uses of wood, improved engineering methods in timber, and research on broader uses for wood.

FORM-TY ENGINEERING GUIDE—Is the title of a new booklet. Offering the most complete information available on concrete form work, this booklet has been well over a year in preparation. It will be forwarded without cost by Richmond Screw Anchor Co., 816 Liberty Ave., Brooklyn, N.Y.

MANGANESE STEEL—What Is manganese steel? What are its constituents? Where does it fit into the war picture? These are only a few of the many questions on this vital metal asked and answered in a new 48-page catalog issued by the American Manganese Steel Division of The American Brake Shoe & Foundry Co., Chicago Heights, Ill.

METERS—Simplex Manometers and Simplex S Rate of Flow Controllers are pictured, diagrammed, and thoroughly described in Bulletins No. 200 and No. 250. Simplex Valve & Meter Co., 68th and Upland Sts., Philadelphia, Penna.

TRACTOR SERVICE MANUAL—The Tractor Division of the Allis-Chalmers Mfg. Co. has released a service manual on their Model "M" 32 hp gasoline powered tractor. Containing 143 pages and 230 illustrations, the manual covers the care, operation, and maintenance of this tractor. Copies are sold at one dollar, postpaid. Industrial Service Dept., Tractor Division, Allis-Chalmers Mfg. Co., Milwaukee, Wis.

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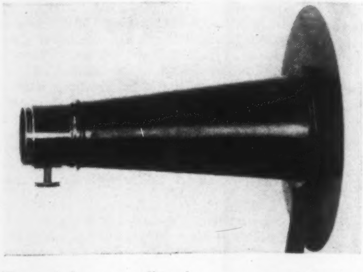

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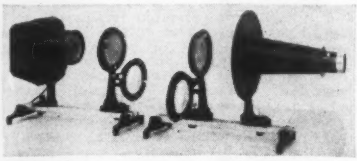

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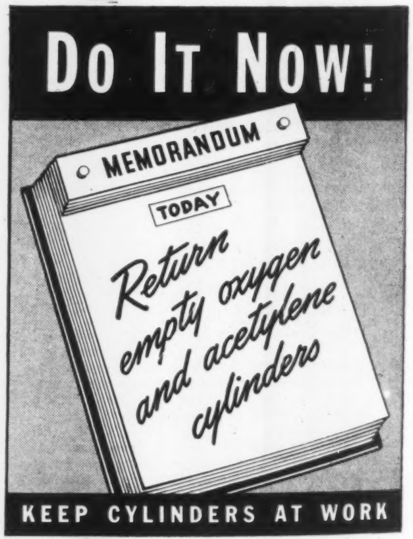

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Drill Cased in Plastic

First public announcement of a new "Thor" plastic 1/4-in. portable electric drill has been made by Independent Pneumatic Tool Company, Chicago, Ill., after nearly a year in which large quantities of the drill have been produced under Army contract. The grip handle, field case, and gear case of the drill are constructed of a tough, light-weight, "Thorite" plastic developed exclusively for "Thor." According to the "Thor" Engineering Department, tests of the plastic drill have proved it to have more power per pound, greater strength and protection from shock, and to be more compact, lighter in weight, and cooler to handle.

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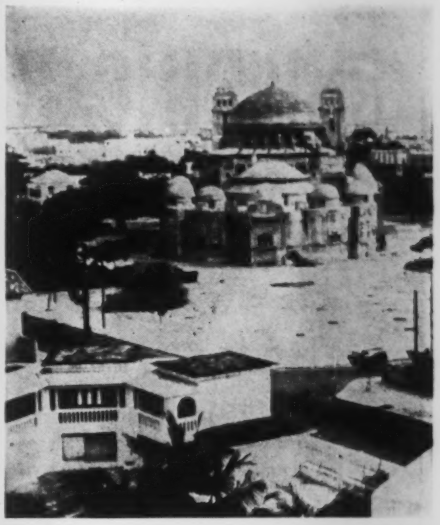
Facts on Pumping Concrete

One hundred and sixty-four pages are crammed with facts on the placement of concrete by pumping, in Bulletin 422—Rex Pumpcrete Practice, published by Chain Belt Company, Milwaukee, Wis.

Chapter I covers the Pumpcrete Method. Placing costs are covered in Chapter II. Distribution methods, the Mixing Plant, Concrete Data and Pumpcrete Data follow in Chapters III to VI. Then there are assembled reprints of periodical literature on typical jobs.



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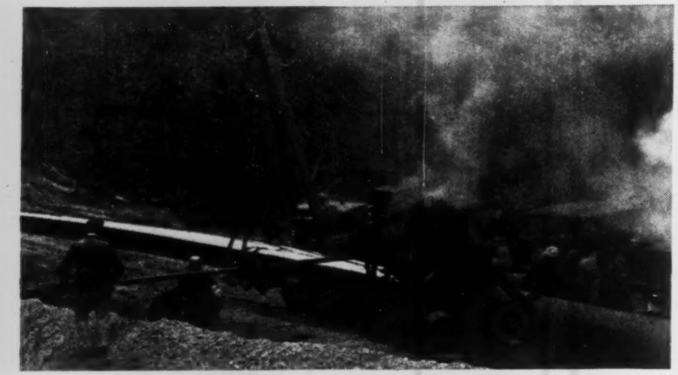

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Peterson, Frank Gustaf Eric (Assoc. M. '43), Asst. Prof., Civ. Eng., Montana State College (Res., 219 West Arthur), Bozeman, Mont.

Petkoff, Peter Pavloff (Jun. '43), Field Engr., James Stewart & Co., Inc., 114th St. and Burley Ave. (Res., 5508 Everett Ave.), Chicago, Ill.

Platt, Howard Charles (Assoc. M. '43), Hydr. Engr., Pacific Bridge Co., 333 Kearny St. (Res., 16 Avila St.), San Francisco, Calif.

Raiffeisen, Otto John (M. '43), Superv. Design Engr., Gulf Oil Corp., 410 Gulf Bldg., Pittsburgh, Pa.

Rascoe, William Marion (Jun. '42), 1st Lt., Corps of Engrs., U.S. Army, 325 Southern St., Corpus Christi, Tex.

Reid, George Frederick, Jr. (Jun. '42), Ensign, CEC-V (S), U.S.N.R., 31st U.S. Naval Constr. Battalion, Care, Fleet Post Office, New York, N.Y.

Robertson, Robert Emmett, Jr. (Assoc. M. '42), 1st Lt., Corps of Engrs., U.S. Army, 157 West Lanvale St., Baltimore, Md.

Roudebush, Edgar Alton (Assoc. M. '43), Senior Engr., State Highway Comm., Masonic Temple (Res., 1308 High St.), Topeka, Kans.

Sale, Robert Clay (Jun. '42), 2d Lt., Corps of Engrs., U.S. Army, 422 Lake Ave., Park Ridge, Ill.

Sandberg, Harold Raymond (Jun. '42), Asst. Plant Engr., Contr. Div., Dravo Corp., 25 Neville Island, Pittsburgh, Pa.

Sanders, Shields Brewer (M. '43), Dist. Engr., State Highway Comm. (Res., 415 South Center Ave.), Miles City, Mont.

Schaetzel, Robert Allyn (Jun. '42), 1st Lt., Corps of Engrs., U.S. Army, Company B, 48th Engr. Regiment, Camp Gruber, Okla.

Schalck, Walter Stanley (Jun. '42), Ensign, CEC-V (S), U.S.N.R., 3370 Twenty-First St., Wyandotte, Mich.

Scherrer, Robert Elmer (Jun. '42), Stress Analyst, Douglas Aircraft Co., El Segundo (Res., 8101 Airlane Ave., Los Angeles), Calif.

Serafini, Lelio (Jun. '42), Aviation Cadet, Air Corps, U.S. Army, 112 Lancaster St., Quincy, Mass.

Sorenson, Earl Emanuel (M. '43), Dist. Constr. Engr., State Div. of Highways, 1365 Harbor St. (Res., 3375 Twenty-Eighth St.), San Diego, Calif.

Spindel, Ervin (Jun. '42), 1405 West Sullivan St., Kingsport, Tenn.

Steimer, Theodore George (Jun. '42), Ensign, U.S.N.R., U.S.S. *Bushnell*, Care, Postmaster, San Francisco, Calif.

Swanson, Harry Archibald (Assoc. M. '43), Asst. Prof., Civ. Eng., North Dakota State College, State College Station (Res., 1211 Sixth St., South), Fargo, N.Dak.

Thommen, Louis Aloysius (Jun. '43), Capt., U.S. Army, 313th Engr. Battalion, Camp Gruber, Okla.

Thornquist, Edwin Alton (Jun. '43), Dept. Head, Specifications, Gannett, Eastman & Fleming, Camp Springs-Meadows, Md. (Res., 2109 Suitland Terrace, S.E., Fairfax Village, Washington, D.C.)

Tripp, Orval Welton (Assoc. M. '43), Office Mgr., Wilson & Co., Box 518, Salina, Kans.

Verjbitsky, Paul Fadd (Assoc. M. '43), Associate Structural and San. Engr., U.S. Engrs., Comm. Bldg. (Res., 1805 East Silver Ave.), Albuquerque, N.Mex.

Walker, Fred Mallett, Jr. (Jun. '42), 1st Lt., Corps of Engrs., U.S. Army, 1014 Sixth Ave., S., Escanaba, Mich.

Wartelle, Robert George (Jun. '42), 2d Lt., Corps of Engrs., U.S. Army, 1509 Eighteenth Ave., N., Seattle, Wash.

Weight, Robert Hogan (Jun. '43), Structural Designer, Donald R. Warren Co., 528 Eighteenth St., Oakland (Res., 2717 Haste St., Berkeley), Calif.

White, Douglas Conyne (Jun. '42), Levelman, Public Roads Administration, Box 59, Haines, Alaska.

Will, Albert Parks (Jun. '43), Junior Engr., Phillips Petroleum Co. (Res., 1301 Dewey Ave.), Bartlesville, Okla.

Williams, James Henry (Jun. '42), Stress Analyst, Douglas Aircraft Co., El Segundo (Res., 514 Veteran Ave., West Los Angeles), Calif.

Willis, James Raymond (Assoc. M. '43), Cons. Engr., 1106 East Cleveland St., Mangum, Okla.

Willis, Sumner Chapin (M. '43), Dist. Supt., The H. K. Ferguson Co., 25 West 43d St., New York, N.Y.

Wilson, James (Assoc. M. '42), 307 Riversdale Rd., Camberwell, E. 6, Melbourne, Victoria, Australia.

Wittwer, Norman Carl (M. '43), Capt., Corps of Engrs., U.S. Army, Box 286, R.D. 2, Trenton, N.J.

Young, Gilman Boardman (M. '43), Prin. Structural Engr., U.S. Engrs., 520 Merchandise Mart Bldg., Chicago (Res., 260 Maple Ave., Elmhurst), Ill.

Membership Transfers

Abell, DeWitt Sterling (Assoc. M. '32; M. '43), Capt., San. Corps, U.S. Army, SCU 1913, Camp White (Res., 522 South Oakdale Ave., Medford), Ore.

Barnett, Harold Arthur (Assoc. M. '29; M. '43), City Engr., Cities of Gardena and San Marino, 35 South Raymond Ave., Pasadena, Calif.

Brest, Alexander (Assoc. M. '24; M. '43), Maj., Corps of Engrs., U.S. Army, 924th Engr. Regiment, Army Air Base, Richmond, Va.

Brown, William Isaac (Assoc. M. '36; M. '43), Lt. Comdr., CEC, U.S.N.R., Public Works Dept., U.S. Naval Operating Base, Newport, R.I.

Dickman, W. Bernard (Jun. '39; Assoc. M. '43), Production and Planning Engr., Barrett & Hilp, Belair Shipyard, South San Francisco (Res., 1622 Lower Grand, Piedmont), Calif.

Farquharson, Frederick Burt (Assoc. M. '36; M. '42), Prof. Civ. Eng., Univ. of Washington, Seattle, Wash.

Fratar, Thomas Joseph (Jun. '37; Assoc. M. '43), Private, U.S. Army, Company B, 363d Eng. Regiment, Camp Claiborne, La.

Goodall, George Edwin (Assoc. M. '23; M. '43), Prin. Engr., U.S. Engr. Office, Box 1739, Sacramento, Calif.

Gramatky, Ferdinand Gunner (Assoc. M. '35; M. '43), Capt., Corps of Engrs., U.S. Army, 272 Annandale Rd., Pasadena, Calif.

TOTAL MEMBERSHIP AS OF MARCH 9, 1943

Members	5,890
Associate Members	7,144
Corporate Members	13,034
Honorary Members	36
Juniors	5,486
Affiliates	72
Fellows	1
Total	18,629
(Total March 9, 1942	17,603)

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Hattrup, Richard Adolph (Jun. '35; Assoc. M. '42), Engr., California Arabian Standard Oil Co., Bahrein Island, Persian Gulf. (Res., 4749 East Tulare St., Fresno, Calif.)

Holmstrom, Helmer August (Jun. '32; Assoc. M. '43), Maj. Air Corps., U.S. Army, Executive Officer, U.S. Air Forces Bombardier School, Army Air Base, Childress, Tex.

Hopkins, Martin Francis (Assoc. M. '37; M. '43), Chf., Civ. and Research Sections, Public Service Comm. of West Virginia, State Capitol Bldg. (Res., 1715 Quarrier St.), Charleston, W.Va.

Houston, Clyde Erwin (Jun. '37; Assoc. M, '43), Associate Water Planning Analyst, Water Utilization Planning Service, U.S. Dept. of Agriculture, Denver, Colo. (Res., 1140 North 41st St., Lincoln, Nebr.)

Jones, James Everett (Assoc. M. '30; M. '43), Civ. Engr., Dept. of Water and Power, 207 South Broadway, Los Angeles (Res., 318 East Randolph St., Glendale), Calif.

Kearney, John Joseph (Assoc. M. '26; M. '43), Cons. Municipal Engr., 3136 Maple Ave., Berwyn, Ill.

Lane, Kenneth Stacy (Jun. '29; Assoc. M. '43), Head, Soils Laboratory, U.S. Engr. Office (Res., 187 Morris Ave.), Providence, R.I.

Larsen, Herluf Thomsen (Jun. '39; Assoc. M. '43), 1st Lt., Corps of Engrs., U.S. Army, Post Engr., Army Post Office 817, New Orleans, La.

Leue, Conrad Ferdinand (Assoc. M. '20; M. '43), Care, The Willard Hotel, Washington, D.C.

Mansur, Cline Lee (Jun. '39; Assoc. M. '42), Maj., Corps of Engrs., U.S. Army, Army Air Base, Box 229, Luke Field, Phoenix, Ariz.

Matthews, James Frederick (Assoc. M. '32); M. '43), Cons. Engr., 307 Washington St., Brooklyn, N.Y.

Miller, Maurice Crane (Assoc. M. '29; M. '43), Mgr., Technical Service Div., Hawkeye Portland Cement Co., 802 Hubbell Bldg. (Res., 5800 Woodland Rd.), Des Moines, Iowa.

Sundstrom, Harald Joseph (Jun. '39; Assoc. M. '43), Engr. (Civ.), U.S. Engr. Dept., 550 Federal Bldg. (Res., 2215 Glenmary Ave.), Louisville, Ky.

Swartz, Gus Joseph (Jun. '35; Assoc. M. '43), Lt. (jg), U.S.N.R., Naval Section Base, San Diego, Calif.

White, Leon Vincent (Assoc. M. '25; M. '43), Prof., Civ. Eng., Kansas State Agri. College, Manhattan, Kans.

Wright, Samuel Robert (Assoc. M. '36; M. '43), Associate Prof., Municipal and San. Eng., Agri. and Mech. College of Texas, Box 252, Faculty Exchange, College Station, Tex.

REINSTATEMENTS

Urbino, Jacinto, Assoc. M., reinstated Feb. 11, 1943.

Ackerson, Duane Wright, Jun., reinstated Mar. 1, 1943.

Buchwalter, Samuel Joseph, Assoc. M., reinstated Mar. 3, 1943.

Winslow, Burton Lyman, M., reinstated Feb. 23, 1943.

RESIGNATIONS

Brooks, Thomas, M., resigned Dec. 31, 1942.

Coan, John Michael, Jr., Jun., resigned Dec. 31, 1942.

Craven, Aaron Sanford, M., resigned Feb. 26, 1943.

Elliott, James William, M., resigned Feb. 23, 1943.

Eshelman, Aven Lamar, Jun., resigned Dec. 31, 1942.

Gray, Alexander, M., resigned Mar. 2, 1943.

Hand, Robert David, Jun., resigned Dec. 31, 1942.

Hook, Howard Arthur, Assoc. M., resigned Feb. 25, 1943.

Lamson, John Lester, Assoc. M., resigned Mar. 8, 1943.

McGinnity, William James, Assoc. M., resigned Dec. 31, 1942.

McIntosh, Walter Townsend, M., resigned Feb. 26, 1943.

Netland, Theodore Jarl Bugge, Assoc. M., resigned Mar. 2, 1943.

Parsons, Norman Welbec, Jun., resigned January 27, 1943.

Thornber, Chalmers Harvey, Jun., resigned Feb. 26, 1943.

Trenholm, John Bohun, M., resigned Feb. 26, 1943.

Applications for Admission or Transfer

Condensed Records to Facilitate Comment from Members to Board of Direction

April 1, 1943 Number 4

The Constitution provides that the Board of Direction shall elect or reject all applicants for admission or for transfer. In order to determine justly the eligibility of each candidate, the Board must depend largely upon the membership for information.

Every member is urged, therefore, to scan carefully the list of candidates published each month in Civil Engineering *and to furnish the Board with data which may aid in determining the eligibility of any applicant.*

It is especially urged that a definite recommendation as to the proper grading be given in each case, inasmuch as the grading must be based upon the opinions of those who know the applicant personally as well as upon the nature and extent of his professional experience. Any facts derogatory to the personal character or professional reputation of an applicant should be promptly communicated to the Board.

Communications relating to applicants are considered strictly confidential.

The Board of Direction will not consider the applications herein contained from residents of North America until the expiration of 30 days, and from non-residents of North America until the expiration of 90 days from the date of this list.

MINIMUM REQUIREMENTS FOR ADMISSION

Grade	General Requirement	Age	Length of Active Practice	Responsible Charge of Work
Member	Qualified to design as well as to direct important work	35 years	12 years	5 years RCM*
Associate Member	Qualified to direct work	27 years	8 years	1 year RCA*
Junior	Qualified for subprofessional work	20 years	4 years	
Affiliate	Qualified by scientific acquirements or practical experience to cooperate with engineers	35 years	12 years	5 years RCM*

* In the following list RCA (responsible charge—Associate Member standard) denotes years of responsible charge of work as principal or subordinate, and RCM (responsible charge—Member standard) denotes years of responsible charge of IMPORTANT work, i.e., work of considerable magnitude or considerable complexity.

APPLYING FOR MEMBER

Abbott, Eli, Jr., Arlington, Va. (Age 45) (Claims RCA 6.7 RCM 14.4) May 1938 to date on staff of Chf. Engr., WPA, Washington, D.C., as Senior Civ. Engr.

Bohn, August Joseph, Atlanta, Ga. (Age 54). (Claims RCA 0.5 RCM 26.9) Dec. 1926 to date Owner, Structural Clay Products.

Bowser, Clarence Dewey, Columbus, Ohio (Age 45) (Claims RCA 1.9 RCM 13.9) July 1939 to date Engr., Bureau of Bridges and Grade Separations, Ohio Highway Dept., Columbus; previously Engr., International-Stacey Corporation, Columbus.

Brenneke, Augustus Martin (Assoc. M.), Denison, Tex. (Age 48) (Claims RCA 8.9 RCM 7.8) June 1941 to date with U.S. Engr. Office, as Engr., and (at present) Senior Engr.; previously in private practice.

Cleary, Edward John (Assoc. M.), Upper Montclair, N.J. (Age 36) (Claims RCM 6.1) June 1935 to date with *Engineering News-Record* as Asst. Editor, Associate Editor, and (at present) Managing Editor.

Dambach, William Nicholas (Assoc. M.), Wilkinsburg, Pa. (Age 58) (Claims RCA 2.0 RCM 32.9) Jan. 1932 to date Pres., W. N. Dambach, Inc., Pittsburgh.

Edwards, Percy Anway, Chicago, Ill. (Age 44) (Claims RCA 1.9 RCM 6.4) Jan. 1943 to date Structural Engr., Montgomery Ward Co.; previously Structural Designer, successively with Div. of Water Works Design, City of Chicago, Holabird & Root, and Graham, Anderson, Probst & White.

Johnson, William Leroy, Tucson, Ariz. (Age 52) (Claims RCA 11.8 RCM 16.1) July 1941 to date Gen. Supt., Arizona Constrs., Phoenix; previously Foreman and Supt., Packard & Tanner & Tanner Constr. Co., Phoenix.

Jolley, Russell Lagrange, Houston, Tex. (Age 47) (Claims RCA 5.7 RCM 17.0) April 1919 to date with Ceco Steel Products Corporation (formerly Concrete Eng. Co.), Omaha, Nebr., as Draftsman, Sales Mgr., and (since Jan. 1922) Dist. Mgr.

Knepper, Earl Hamaker, Los Angeles, Calif. (Age 61) (Claims RCA 7.8 RCM 27.1) 1941 to date Engr., Koebig & Koebig, Engrs.; previously Engr., PWA, San Francisco; Engr. and Contr., Los Angeles.

Kupperman, Solomon Jack, Chicago, Ill. (Age 47) (Claims RCA 7.3 RCM 7.5) June 1933 to date with Div. of Water-Works Design, Chicago, as Eng. Draftsman, and (since May 1937) Structural Designer.

Leibee, Hugh Case, Minneapolis, Minn. (Age 62) (Claims RCA 20.0 RCM 15.4) April 1918 to July 1931 and March 1933 to date Field Engr., Portland Cement Association.

Levander, Carl Gustaf (Assoc. M.), Austin, Tex. (Age 44) (Claims RCA 4.8 RCM 14.9) May 1928 to date with City of Austin, as Sewer Engr., and (since July 1932) Supt., Sewer Div.

MacNaughton, Ernest Boyd (Assoc. M.), Portland, Ore. (Age 62) (Claims RCM 11.7) April 1928 to June 1932 Stockholder and Executive Vice-Pres., and June 1932 to date Pres., First National Bank of Portland; previously member of firm, Strong & MacNaughton, and Treas., Strong & MacNaughton Trust Co., Portland.

McCurrach, David Farquharson (Assoc. M.), Yakima, Wash. (Age 61) (Claims RCA 11.5 RCM 19.3) May 1942 to date Asst. Gen. Mgr. Pacific Power & Light Co.; previously Rate Engr. and Consultant, Northwestern Elec. Co., and Pacific Power & Light Co., Portland, Ore.

Neumann, Harold Carl, Des Moines, Iowa. (Age 49) (Claims RCM 25.3) Nov. 1919 to March 1931 with A. H. Neumann & Co.,

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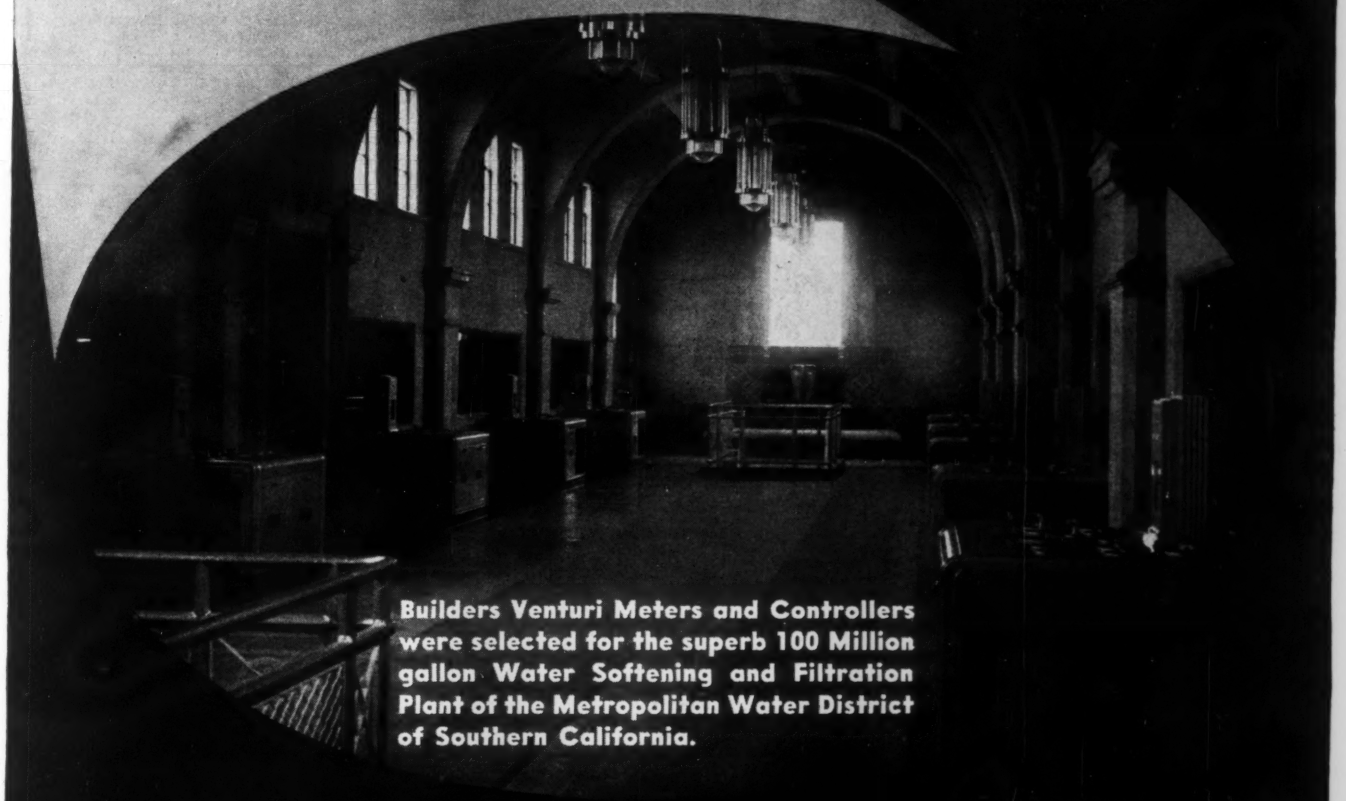

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and March 1931 to date with A. H. Neumann & Bros., Inc., in various capacities, since Jan. 1940 as Engr., Secy., and Treas.

Palmer, Benjamin Henry, Jr. (Assoc. M.), Norwich, Conn. (Age 41) (Claims RCA 7.0 RCM 7.1) May 1942 to date with Ford, Bacon & Davis, Groton, Conn.; previously with Chandler & Palmer, Norwich, as member of firm.

Park, Kenneth Foote (Assoc. M.), Peoria, Ill. (Age 51) (Claims RCA 6.2 RCM 10.5) March to June 1931, Foreman and Supt., and Feb. 1933 to date, Chf. Field Engr., R. G. Le Tourneau, Inc.

Paxson, Glenn Stuart (Assoc. M.), Salem, Ore. (Age 49) (Claims RCA 3.2 RCM 20.7) April 1919 to date with Oregon Highway Dept., as Transitman and Structural Inspector, Res. Bridge Engr., Asst. Bridge Engr., and (since Oct. 1935) Bridge Engr.

Pinel, Stanley Iven, Washington, D.C. (Age 45) (Claims RCA 2.3 RCM 20.1) Nov. 1942 to date Head Engr., Governmental Div., War Production Bd.; previously Chf. Administration Analyst and Prin. Engr., F.W.A.; Director of Research, American Public Works Association.

Plant, Arthur Fletcher, Birmingham, Mich. (Age 49) (Claims RCA 8.2 RCM 15.5) April 1920 to date with The Austin Co., in various capacities, since Jan. 1938 as Vice-Pres. and Mgr., Detroit Office.

Santos, Tirso Nollora, Jr. (Assoc. M.), Washington, D.C. (Age 40) (Claims RCA 6.6 RCM 7.2) Jan. 1941 to date with War Dept., Washington, D.C., in various capacities, at present as Structural Engr., Office of Chf. of Engrs., Ft. Meyer, Va.; previously Asst. Structural Engr., Office of Superv. Archt., Treasury Dept., Washington.

Senior, Harold Joseph, Williamsville, N.Y. (Age 42) (Claims RCA 4.5 RCM 12.2) Jan. 1931 to date member of firm, Fretts, Tallamy and Senior.

Stubbs, Henry Franklin (Assoc. M.), San Juan, Puerto Rico. (Age 48) (Claims RCA 11.1 RCM 7.4) April 1942 to date Chf. Engr. for contractors, Arundel Corporation, Consolidated Eng. Corporation and Hardaway Contr. Co., Baltimore, Md.; previously Superv. Engr., Ambursen Eng. Corporation, New York City; in charge of project at Possum Kingdom Dam, Tex.

Sturgeon, George Blair, Sr. (Assoc. M.), Lafayette, Calif. (Age 69) (Claims RCA 19.4 RCM 13.7) July 1924 to date with East Bay Municipal Utility Dist., Oakland, as Div. Engr., and (since June 1929) Maintenance Engr.

Wallace, Clark Edward, Red Bank, N.J. (Age 36) (Claims RC 7.1) March 1930 to date with Tuller Constr. Co., as Estimator, Buyer Home Office Project Mgr., and (since May 1941) Traveling Project Mgr.

Wallhouse, Harold, Aldenham, Herts., England. (Age 38) (Claims RCA 1.5 RCM 12.3) 1938 to 1939 Civ. Engr., and 1941 to date Chf. Civ. Engr., Colne Valley Water Co., Watford, Herts.; in the interim Civ. Engr., under Civ. Engr.-in-Chf. to Admiralty, acting as Res. Engr. on plan for construction of Naval Armament Depot, Wiltshire.

Wetherell, Edwin Henry, Des Moines, Iowa. (Age 48) (Claims RCM 15.6) Aug. 1927 to date member of firm, Wetherell & Harrison, Archts., Des Moines.

White, Richard Charles, Buffalo, N.Y. (Age 57) (Claims RCA 10.3 RCM 13.4) May 1942 to date City Engr., Buffalo; previously with WPA, as Field Engr. and Area Supt.

Woolpert, Ralph Lash, Dayton, Ohio. (Age 46) (Claims RCA 7.6 RCM 13.1) June 1942 to date Owner of Ralph L. Woolpert, Co., Cons. Engrs.; previously member of firm, Putnam & Woolpert.

APPLYING FOR ASSOCIATE MEMBER

Aurnhammer, Walter Ludwig, Summit, N.J. (Age 44) (Claims RCA 15.3) 1940 to 1942 and Jan. 1943 to date private practice with John J. Kentz, Civ. Engr.; in the interim Constr. Engr., Brann & Stuart, South Somerville, N.J.; previously Supervisor, New Jersey Highway Dept.

Bassett, Ellsworth Watson, Arlington, Va. (Age 36) (Claims RC 5.0) Feb. 1930 to date with U.S. Engrs., in various capacities, at present as Senior Engr.

Bateman, John Henry, Kansas City, Kans. (Age 27) (Claims RC 4.0 D 2.3) Nov. 1940 to date Design Engr., The Marley Co., Inc.; previously Eng. Draftsman, Phillips Petroleum Refinery; Draftsman, Petty Geophysical Eng. Co.

Beadie, William McGregor, St. Paul, Minn. (Age 33) (Claims RCA 4.9) Sept. 1941 to date Acting Director, Minnesota Aeronautics Comm.; previously with WPA, as Area Engr., and Engr.

Cardwell, Thomas Lloyd, Oak Park, Ill. (Age 38) (Claims RCA 14.7) Oct. 1942 to date Sales Engr., Armco Drainage & Metal Products, Inc., Chicago, Ill.; previously Sales Engr., The W. Q. McNeall Constr. Co. of Ill.

Carr, James Henry, Jr. (Junior), Washington, D.C. (Age 28) (Claims RCA 5.0) June 1936 to date Structural Engr., Timber Eng. Co., Washington, D.C.

Corbett, Harry Howard, El Paso, Tex. (Age 37) (Born RCA 13.6) Feb. 1941 to date Chf. Draftsman, Prouty Bros. Eng. Co., Denver, Colo.; previously Office Engr., Helland & Drought, Camp Wallace, Tex.; with Texas Highway Dept.

Critelli, Frank Louis, Mt. Lebanon, Pa. (Age 29) (Claims RCA 8.7) 1935 to date with Sharpsburg Constr. Co., Inc., last 2 years being Vice-Pres.

Diven, John Allen, Baltimore, Md. (Age 39) (Claims RCA 9.1 RCM 5.5) Nov. 1937 to date Asst. Engr., Bridge Dept., Maryland Roads Comm.

Drago, Emanuel Anthony, Mobile, Ala. (Age 32) (Claims RCA 2.5 RCM 0.2) Feb. 1938 to date with U.S. Engr. Office, in various capacities, since Sept. 1942 as Associate Engr. (Civ.).

Driskell, John Joseph (Junior), San Gabriel, Calif. (Age 31) (Claims RCA 2.1 RCM 1.0) Jan. 1942 to date Associate Engr. (Structural), U.S. Engrs., Los Angeles Dist.; previously Structural Designer (Asst. Engr.), Panama Canal; Structural Draftsman and Detailer, American Bridge Co.

Eljashev, Alexander (Junior), New York City (Age 30) (Claims RCA 4.2) Dec. 1940 to date. Structural Designer, New York City, successively with Francisco & Jacobus, Shreve, Lamb & Harmon-Fay, Spofford & Thorndike, Archts. & Engrs., and (since Jan. 1942) Foster Wheeler Corporation; previously Instructor, Mondell Inst., New York City; Draftsman, National Excavation Corporation.

Emery Roy William, Niagara Falls, Ont., Canada. (Age 34) (Claims RCA 6.4 RCM 0.9) June 1942 to date Designer, H. G. Acres and Co., Cons. Engrs.; previously Asst. to Constr. Supt., then Company Civ. Engr., Demerara Bauxite Co., British Guiana; with Trinidad Leaseholds Ltd., Trinidad, B.W.I.

Flay, George Francis, Jr. (Junior), Astoria, N.Y. (Age 30) (Claims RCA 2.8 RCM 2.6), Dec. 1935 to date with Spencer, White & Prentis, Inc., New York City, since July 1941 as Constr. Engr.

Gareis, Charles Augustus, Baltimore, Md. (Age 37) (Claims RCA 4.5 RCM 3.0) June 1933 to date in private practice selling steel products for Bethlehem (Pa.) Fabricators, Inc., Potts Mfg. Co., Mechanicsville, Pa., American Steel Eng. Co., Philadelphia, Pa., Gabriel Steel Co., Detroit, Mich., and others.

Hamlyn, Wilfred Thomas (Junior), El Paso, Tex. (Age 30) (Claims RCA 1.4) Sept. 1942 to date Draftsman, The Stearns-Roger Mfg. Co., Amarillo; previously Designing Engr.-Headman, Ferguson & Carollo, Cons. Engrs., Phoenix, Ariz.; Office Engr., Texas Highway Dept., El Paso.

Herrmann Milton Carl, Milwaukee, Wis. (Age 32) (ClaimsRCA 2.2) July 1942 to date withMason & Hanger Co. as Eng. Designer at Badger Ordnance Works, Baraboo; previously Archt., Milwaukee County (Wis.) Regional Planning.

Hester, Harland Harvey, Ft. Worth, Tex. (Age 44) (Claims RCA 9.2 RCM 8.7) 1940 to date Street Supt., City of Ft. Worth; previously with WPA, as Dist. Field Supervisor, and (later) Area Engr.

Hood, James Edward, Norfolk, Va. (Age 32) (Claims RCA 4.2 RCM 1.5) Sept. 1942 to date as Constr. Engr., Tidewater Constr. Corporation; previously Engr., C. A. Didden Co.; with District of Columbia in various capacities, finally as Asst. to Res. Engr. on Penn. Ave. Bridge project.

Hyzen, Leon, Highland Park. Ill. (Age 33) (Claims RCA 4.2) Oct. 1942 to date Asst. Constr. Mgr., George A. Fuller Co.; previously Chf. Site Planner, Eggers & Higgins, New York City; Site Planner and Arch. Designer, Shaw, Naess & Murphy, Archts.; Site Planner and Designer, C. H. Ziegler, Archt.; Senior Draftsman with Associated Archts., New York City.

King, Richard (Junior), San Antonio, Tex. (Age 31) (Claims RCA 2.6) June 1942 to date 1st Lieut., San. Corps, U.S. Army; previously Instructor in Civ. Eng., Univ. of Connecticut; Graduate Asst., Illinois Inst. of Technology; Senior Office Asst., Texas Highway Dept.

McDonald, Harris Robert, Salt Lake City, Utah. (Age 30) (Claims RCA 4.6) Nov. 1939 to date with U.S. Geological Survey, until Sept. 1942 Jun. Hydr. Engr. and (since Sept. 1942) Asst. Hydr. Engr.; previously with U.S. Soil Conservation Service.

McKinley, Donald Black, New York City. (Age 29) (Claims RCA 1.9 RCM 1.3) July 1936 to date with Spencer, White & Prentis, Inc., in various capacities, since Jan. 1942 as Engr. and (at present) Project Mgr.

Mangasarian, Richard Dicran (Junior), Cristobal, C.Z. (Age 29) (Claims RCA 2.3) Jan. 1940 to date with Div. Engr., Panama Canal Dept., C.Z., as Jun. Engr., and (since June 1940) Asst. Engr.; previously Civ. Engr., Shell Union Oil Co., Venezuela.

Maring, John Elmer, Kansas City, Mo. (Age 42) (Claims RCA 6.7) July 1940 to date with Eng. Div., Dept. of Public Works, Kansas City, as Supt. of Constr., and (since April 1942) Constr. Engr.; previously Gen. Supt. and Engr., M. E. Gillioz, Inc., Gen. Contr., Monett, Mo.

Matteson, Eldon Franklin (Junior), Rome, N.Y. (Age 28) (Claims RCA 4.2) Feb. 1937 to Feb. 1939 and March 1942 to date with Turner Constr. Co., New York City, in various capacities, since March 1942 as Asst. Supt.; in the interim Shift Engr., Rust Eng. Co., and Chf. Engr., A. J. Saville, Inc., both in Portsmouth, Va.; Res. Engr., with B. O. Vannort, Cons. Engr., Charlotte, N.C.

May, Harold Leo, Palo Alto, Calif. (Age 31) (Claims RCA 2.0) June 1937 to date with City of Palo Alto, as Supt., and (since April 1941) Engr., Water and Sewer Div.

Nelson, Curtis Andrew, Pine Bluff, Ark. (Age 38) (Claims RCA 4.9 RCM 1.6) July 1934 to Dec. 1937 1st Lieut. (Reserve Officer), Nov. 1940 to April 1942 Capt., and April 1942 to date Major, U.S. Army; in the interim with WPA, as Supt. of Constr., and Asst. to Dist. Engr.

Novak, Edward Martin, Elizabethton, Tenn. (Age 32) (Claims RCA 6.7) July 1941 to date with Chas. T. Main, Engrs., as Foundation and Design Engr., and (since July 1942) Engr.; previously with Chf. Engr., Materials and Constr. Co., Chicago, Ill., finally as Structural Engr.

Ogburn, Thomas Jefferson, III (Junior), Richmond, Va. (Age 29) (Claims RCA 1.3) June 1936 to date with Virginia Highway Dept., as Draftsman, Jun. Bridge Design Engr. and (at present) Senior Bridge Design Engr.

Petty, Albert Worth, Virginia Beach, Va. (Age 29) (Claims RCA 2.0) 1940 to date Sanitation Officer, Va. Dept. of Health; previously with Div. of San. Eng., N. C. Board of Health, as Sanitarian, then Dist. Sanitarian.

Plummer, Allen Ernest, Honolulu, Hawaii. (Age 48) (Claims RCA 9.1 RCM 11.3) April 1941 to date Engr. U.S. Engrs., Dist. Engr's. Office, Honolulu; previously Office Engr., Planning Sec., Bureau Yards & Docks, Mare Island Navy Yard; Res. Engr., 9th Corps Area, U.S. Army.

Rogers (formerly Rothbart), Paul, Chicago, Ill. (Age 33) (Claims RCA 1.0 RCM 3.2) March 1942 to date Structural Engr. in Chg., A. J. Boynton & Co., Metallurgical Engrs.; previously Structural Engr., Public Utility Eng. and Service Corporation, Chicago; Structural Designer and Arch. Draftsman with I. M. Cohen, Archt., Chicago; Cons. Engr. (private practice), Nagy-Varad, Hungary.

Seligmann, Irving Sidney, Seguin, Tex. (Age 29) (Claims RCA 3.9) Nov. 1937 to Nov. 1940 and Feb. to Aug. 1941 with Texas Highway Dept. in various capacities, finally as Senior Office Asst., Aug. 1941 to date with Corps of Engrs., U.S. Army as Associate Engr. (P-3), Camp Bowie and San Antonio, Tex.

Steyer, Clark, Chanute, Kans. (Age 46) (Claims RCA 13.3 RCM 3.1) April 1929 to date with Kansas Highway Comm. as Res. Engr., and (since Jan. 1937) Asst. Div. Engr.

Thatcher, William Miller, Chicago, Ill. (Age 28) (Claims RCM 2.2) June 1939 to date with American Bridge Co., as Draftsman, Civ. Engr., and (since Jan. 1941) Designer.

Thomas, William Henry, Pittsburgh, Pa. (Age 34) (Claims RCA 6.4 RCM 2.2) Feb. 1941 to date Plant Engr., Pittsburgh Coke & Iron Co., Neville Island, Pa.; previously with Hunter Steel Co.

Van Alstine, Lewis Klein, Savannah, Ga. (Age 53) (Claims RCA 25.3) Jan. 1935 to date Tech. Sales Engr., Barrett Div., Allied Chemical & Dye Corporation, New York City.

Vander Velde, Theodore Louis (Junior), Rolla, Mo. (Age 31) (Claims RCA 2.5) Sept. 1942 to date Asst. Prof., Civ. Eng. Dept., Missouri School of Mines, Rolla, Mo.; previously Sanitarian, Bureau of Eng., Michigan Dept. of Health, Lansing; Instructor, Coll. of Eng., Univ. of Arkansas, Fayetteville.

Von Schlatzer, Robert Karl (Junior), San Jose, Costa Rica. (Age 31) (Claims RCA 0.3 RCM 1.9) Feb. 1941 to date with U.S. PRA, as Asst. Highway Engr., Panama City, Panama, and (since May 1941) Associate Highway

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Engr., San Jose; previously with Special Eng. Div., The Panama Canal, as Senior Eng. Draftsman, and Prin. Eng. Draftsman.

Westin, Waldemar Harold, Norris, Tenn. (Age 32) (Claims RCA 2.1) Dec. 1935 to date with TVA, Knoxville, in various capacities, since Jan. 1942 as Associate Structural Engr.

Wetzel, Charles Ray, Cleveland Heights, Ohio. (Age 35) (Claims RCA 2.0) March 1937 to date with The Austin Co., Cleveland, as Structural Detailer and Checker, and (since 1939) Structural Engr.

Whitley, Fenner Harvey (Junior), MacDill Field, Fla. (Age 31) (Claims RCA 2.8) May 1941 to date 1st Lieut., and (at present) Capt., Sn.C., Army Air Base; previously Instructor in San. Eng., New York Univ.

Wood, Alan Arthur, West Chevy Chase, Md. (Age 51) (Claims RCA 10.0) 1912 to 1917 and 1919 to date with Bldrs. Iron Foundry, Providence, R.I.; since 1940 also member of firm, Luther and Wood, Washington, D.C.

Yasko, Karel Henry, Baraboo, Wis. (Age 31) (Claims RCA 3.4) June 1941 to date Chf. Draftsman, Mason & Hanger Co., Contrs.; previously Prin. Draftsman (Arch.), War Dept.; Arch. Designer and Draftsman, American Oil Co.

Yoder, Sterling Norsworthy, Norfolk, Va. (Age 36) (Claims RCA 3.5) March 1939 to date with U.S. Engr. Office, successively, as Dredging Inspector, Eng. Aide, Senior Eng. Aide, and (since Nov. 1941) Asst. Engr.

APPLYING FOR JUNIOR

Barron, Reginald Arnold, Providence, R.I. (Age 29) Nov. 1938 to date with U.S. Engr. Office, War Dept., at present in Analysis Sec., Dist. Soils Laboratory.

Crutcher, James Whitmore, Meadville, Pa. (Age 30) (Claims RCA 5.7) April 1941 to date Eng. Designer, Fraser-Brace Eng. Co.; previously with E. T. Archer Co.

Glass, George Caswell, Middleton, Wis. (Age 27) (Claims RCA 4.5) Nov. 1940 to date with Mason & Hangar Co., at present at Badger Ordnance Works, Baraboo, Wis.; previously with Ohio Highway Dept.

Hartwell, James Haywood, Boston, Mass. (Age 28) June to Sept. 1941 Recorder and Sept. 1941 to date Jun. Engr., U.S. Geological Survey.

Hawker, Clarence Robert, Tacoma, Wash. (Age 30) Oct. 1942 to date Asst. Design Engr., Second Nisqually Power Development; previously Jun. Naval Archt. and Asst. Naval Archt., Puget Sound Navy Yard.

Himelright, Loring Kenneth, Charleston, S.C. (Age 23) Sept. 1940 to date at Charleston, (S.C.) Navy Yard, as Jun. Civ. Engr., and (since Jan. 1942) Asst. Civ. Engr.

Hoehl, John Jacob, Balboa, C.Z. (Age 27) (Claims RCA 3.3) Sept. 1942 to date Associate Engr., The Dept. Engr., Corozal, C.Z.; previously Asst. Engr. on surveys for military work, etc.

Joseph, Joseph Albert, State College, N.Mex. (Age 30) (Claims RCA 1.5) Aug. 1941 to date Instructor in civil engineering, New Mexico State Coll.; previously Steel Designer, Stone & Webster Eng. Co., Boston; Aircraft Designer, United Aircraft Corporation, Stratford, Conn.

McDonald, William Jamison, Chattanooga, Tenn. (Age 25) June 1941 to date with Maps and Surveys Div., TVA, as Jun. Civ. Engr., and (since Jan. 1943) Asst. Civ. Engr.

McPhearson, Robert Mills, Pascagoula, Miss. (Age 28) (Claims RCA 1.2) Summer 1941 Field Engr., and Feb. 1942 to date Chf. Field Engr., Ingalls Shipbuilding Corporation; previously with U.S. Engr. Dept., Vicksburg, Miss.

Masur, Ernest Frank, Chicago, Ill. (Age 23) Feb. 1942 to date Draftsman, Arthur G. McKee & Co., Indiana Harbor, Ind.; previously Draftsman, H. A. Brassert & Co., Pittsburgh, Pa.

Rock, Philip Arthur, Norwalk, Conn. (Age 24) Feb. 1942 to date Engr.-Supt., Pascone Bros., Inc., Gen. Contrs. and Excavators, Bridgeport.

Rowland, Everett Wesley, Denver, Colo. (Age 27) (Claims RCA 1.0) Oct. 1938 to date with Bureau of Reclamation, in various capacities, at present as Asst. Engr.

Sages, Daniel, Boston, Mass. (Age 24) (Claims RCA 0.5) April 1942 to date Designing Draftsman, Stone & Webster Eng. Co., Boston; previously graduate student, State Univ. of Iowa; also Testing Engr., PWA airport project, Iowa City, Iowa.

Torrence, Carl Linden, Richmond, Va. (Age 31) (Claims RCA 3.0) March 1942 to date Draftsman, R.F. & P.R.R., Richmond; previously Estimator and Chf. Draftsman, Cruickshanks' Iron Works, Richmond.

1942 GRADUATES

UNIV. OF CALIF.

(B.S. in Civ. Eng.)

	Age
Byerrum, Severen Alfred	(24)

CORNELL UNIV.

(C.E.)

Bissell, Arthur Douglas, 2d	(25)

(M.S. in Eng.)

Koo, Hai-Chang Benjamin	(23)

GA. SCHOOL TECH.

(B.S. in C.E.)

Peacock, Cassius Lee, Jr.	(22)

UNIV. OF MICH.

(M.S. in E.)

Basaran, Enver	(31)

N. DAK, AGRI. COLL.

(B.S.)

Anderson, Melvin Hylden	(26)

PA. STATE COLL.

(B.S. in C.E.)

Hunsicker, Robert Levinus	(22)
Ritchie, William Davey, Jr.	(23)
Seiler, Paul	(25)

1943 GRADUATES

UNIV. OF AKRON

(B.C.E.)

Seese, Alfred Ray, Jr.	(22)

BUCKNELL UNIV.

(B.S. in C.E.)

Anderson, William Joseph	(20)
Gerla; Marvin	(21)
Mann, Hiram Bloom	(22)
Sheridan, Marlin Lee	(21)

COOPER UNION

(B.C.E.)

Sittner, Walter Theodore	(21)

CORNELL UNIV.

(C.E.)

Miller, Edward August	(27)

(B.S. in Adm. Eng.)

Hewett, Robert Wayne	(22)

(B.C.E.)

Aisenberg, Bernard Paul	(20)
Hildabrand, Theodore Joseph	(27)
Marquart, Otto	(24)
Thalman, Walter Alfred	(22)

UNIV. OF FLA.

(B.C.E.)

Royer, Daniel King	(21)

GEORGE WASHINGTON UNIV.

(B.C.E.)

Pastoriza, Tomas Augusto	(24)

GA. SCHOOL TECH.

(B.S. in C.E.)

Adams, James William	(22)
Stephenson, James Elmer	(24)

ILL. INST. TECH.

(B.S. in C.E.)

Davies, Marshall Frederick	(24)
Fenster, Charles Albert	(20)
Freiman, Albert	(22)
Johnson, Swan Milton	(24)
Kasman, John Clark	(21)
Kotiza, Edward	(26)
Kriesberg, Isadore Edward	(24)
Padalik, Miles	(21)
Peller, Charles George	(22)
Silla, Marrio Rocco	(21)

UNIV. OF ILL.

(B.S. in C.E.)

Coel, Joseph	(22)
Davis, John Robert	(22)
Graham, Carl Grant, Jr.	(21)
Harper, Donald Edward	(20)
Kesler, Clyde Ervin	(20)
Lambert, Lowell Edward	(24)
Schacht, Otto William, Jr.	(23)

(B.S. in A.E.)

Thuman, Dale Exstrom	(27)

JOHNS HOPKINS UNIV.

(B.C.E.)

Cohn, Harold Paul	(20)

KANS. STATE COLL.

(B.S.C.E.)

Waggoner, Grant Wyckliffe, Jr.	(22)
Walker, Robert Hewitt	(27)

MASS. INST. TECH.

(S.B.)

Barco, Virgilio	(21)
Coulson, Paul Russell	(22)
Eisenberg, Eugene Robert	(20)
Holway, William Nye	(22)
Libby, James Walter	(22)
Wells, Walter Goodwin	(22)

MISS. STATE COLL.

(B.S.)

Leak, Harrison Carter, Jr.	(21)

UNIV. OF MISS.

(B.S.E.)

Fenger, Albert Charles	(20)

UNIV. OF NOTRE DAME

(B.S. in C.E.)

Collins, Robert William	(20)
Farmer, Thomas Moran	(22)
Fitzpatrick, Joseph William	(22)
Mengel, William Forrest	(22)
Zimmer, Ernest Edward	(23)

UNIV. OF PITTSBURGH

(B.S. in Civ.Eng.)

McNaughton, Harold Willard	(26)
Weaver, Gerald Gregory	(29)

R.I. STATE COLL.

(B.S. in C.E.)

Kulick, Matthew John	(22)
Webster, William Stephen	(23)

S.DAK. STATE SCHOOL OF MINES

(B.S. in C.E.)

Babcock, John Orlo	(21)

UNIV. OF S. CALIF.

(B.E.)

Coble, Roy Elvin	(21)
McConville, Lawrence, II	(22)
Martindale, George Norman	(21)
Timms, Avery Junior	(22)
Tweedt, James Elmer	(21)

STANFORD UNIV.

(A.B. in Eng.)

Dashiell, Robert Freeland	(22)
Hogan, John Thomas	(25)

SWARTHMORE COLL.

(B.S. in C.E.)

Beatty, Royce Edwards	(22)
Leimbach, Herbert John, Jr.	(22)
Lohr, Freeman Wilburn	(22)
Myers, Philip, III	(21)
Wheaton, Robert Garth	(21)

(B.S. in M.E.)

Ullman, David Ulrich	(22)

TEX. A. & M. COLL.

(B.S.)

Barth, Thomas Sonly	(21)
Bauml, Joseph Anthony	(23)
Burns, Robert Emmett, Jr.	(23)
Fry, Edward, Jr.	(24)
Keirsey, Robert Leslie, Jr.	(22)
Maceiras, Richard P.	(21)
McSpadden, Earle Freedyne, Jr.	(20)
Sullins, Robert Timothy, Jr.	(24)
Thenn, George Rudolph, Jr.	(24)
Thompson, Burrel Braley	(23)

WASHINGTON UNIV.

(B.S. in C.E.)

Branahl, Erwin Fred	(21)

WORCESTER POL. INST.

(B.S. in Civ. Eng.)

Durkee, Jackson Leland	(20)

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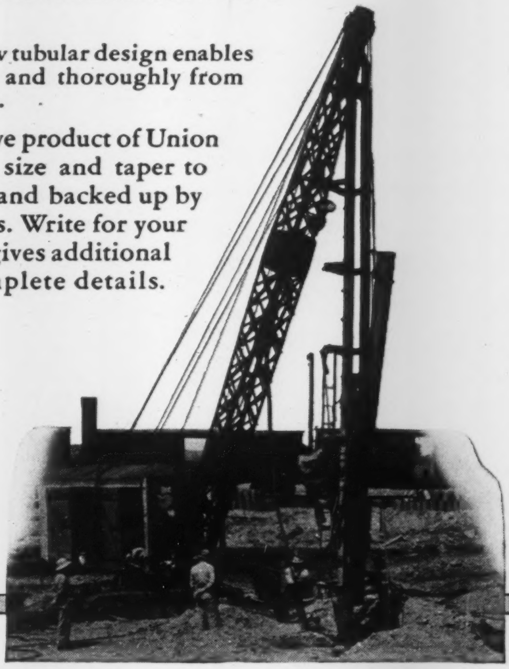

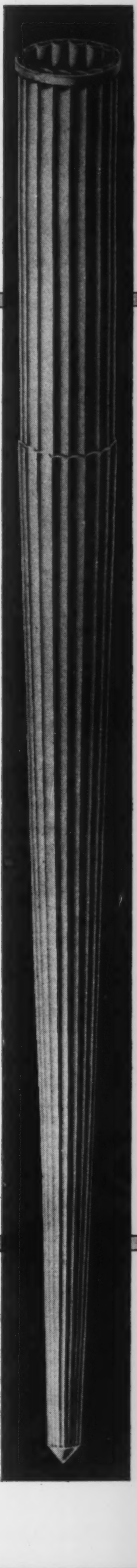

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CONSTRUCTION ENGINEER; Assoc. M. Am. Soc. C.E.; 52; 27 years' broad experience in civil engineering—17 years in responsible charge of design and construction, irrigation, drainage, dams, and flood control projects. Ability to organize construction crews, mechanical crews, engineers, clerks, etc., into good construction organization and get results. C-970.

CIVIL ENGINEER; M. Am. Soc. C.E.; 26 years' experience in hydraulic and structural design desires permanent employment in Mexico or South America. Speaks and writes Spanish, French, and Russian. Qualifications and references supplied on request. C-971.

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CIVIL ENGINEERS, over 40, not necessarily graduates, with good ground work in the fundamentals of structures. Should have had some experience or training in the theory of structures, steel design—such as buildings, bridges, reinforced concrete, stress analysis, hydraulics, sheet metals, strength of materials, architectural design, and drafting. Would also prefer men who have had 3 to 5 years' experience. Will be in the aeronautical industry. Permanent. Apply by letter requesting application blanks. Location, East. W-1690.

INSTRUCTOR OR ASSISTANT PROFESSOR in civil engineering; preferably qualified to teach work in the sanitary field, surveying, and one or two courses in structures. Salary, $1,800 for an instructor, or $2,500 a year for an assistant professor. Location, New England. W-1744.

CIVIL ENGINEER, 45–60, for office engineering work, outlining advance construction work and materials; some layout work; specifications and contract experience desirable. Any shipyard construction experience would be especially helpful. Fairly permanent for the duration. Salary, $20 per diem. Location, Washington, D.C. W-1821.

SUPERINTENDENTS OR MANAGERS of concrete pipe manufacturing plants. Salary, minimum of $2,600 a year. Locations, northern New Jersey, Philadelphia, Washington, D.C., and Virginia. Headquarters, New Jersey. W-1831.

ENGINEERS, young, with water-works experience. Salaries, $3,600–$4,600 a year. Location, Washington, D.C. W-1847.

OFFICE ENGINEER, preferably a recent graduate in civil engineering, but will consider older man with proper qualifications. Should be capable of making working sketches of concrete pours and concrete formwork, calculating concrete quantities from working drawings, plotting earthwork cross sections, etc. Previous experience in this type of work not necessary if applicant has good educational background of mathematics and drawing. Opportunity for permanent position if well qualified. Salaries for recent graduates, $2,400 a year to start; for man with some previous experience, $3,000 a year to start. Location, Pennsylvania. W-1855.

INSTRUCTOR in civil engineering, to teach surveying, strength of materials, or soil mechanics. Must have been in upper half of class. Salary, $2,600 a year. Location, New York, N.Y. W-1895.

ENGINEERS over 38. (*a*) Combination mechanical and structural engineer with some experience with timber. (*b*) Structural engineer who also has had some experience with timber. Salaries, about $3,000–$3,300 a year to start. Prefer applicants who live in or near Washington, D.C. W-1907.

ASSOCIATE OR ASSISTANT PROFESSOR OF STRUCTURAL ENGINEERING. Apply by letter, giving complete statement of training, experience, and personal data, and include photograph. Salary, $2,900 for 9 months' work with prospect of summer employment at extra compensation. Location, South. W-1921.

ENGINEERS. (*a*) Civil engineer, chief of party, to give accurate line and grade on shipyard work. (*b*) Architectural draftsman or marine draftsman with some experience in shipyard construction. Salary, $3,120–$3,640 a year. Location, northern New Jersey. W-1941.

CONCRETE SHIP DESIGNERS. Must have had some experience in this type of work. Salary open. Location, New York, N.Y. W-1964.

INSTRUCTOR IN CIVIL ENGINEERING, who is qualified to teach junior and senior civil engineering subjects. University now 100% on the army specialized war training program. Salary, $2,200–$2,400 for calendar year. Location, New England. W-1973.

CIVIL ENGINEERS experienced on hydraulic design or construction for large defense job. Can use designers, $3,600–$4,200 a year; draftsmen, $2,400–$3,600 a year; concrete inspectors, a concrete technologist, computers, and surveyors. Apply by letter giving full details and salary expected. Duration, about 7 months. Location, Washington. S-343.

RECENT BOOKS

New books of interest to Civil Engineers donated by the publishers and filed in the Engineering Societies Library, or in the Society's Reading Room, will be found listed here. The notes regarding the books are taken from the books themselves and are edited by members of the staff of the Society or of the Library. Those books which are in the Library may be borrowed by mail by Society members for a small handling charge.

✓ (THE) ARMY ENGINEERS IN REVIEW. By B. W. Leyson. E. P. Dutton & Co., New York, 1943. 202 pp., illus., maps, charts, diagrs., 8½ × 5½ in., cloth, $2.50.

This book describes the work of the Corps of Engineers of the U.S. Army in peace and in war. It also gives something of its history and tells how it is organized and trained. Young men interested in joining the Corps will find information on the training required and the fields of work.

✓ ENGINEERING MECHANICS. By G. N. Cox. D. Van Nostrand Co., New York, 1943. 301 pp., diagrs., charts, tables, 9½ × 6 in., cloth, $3.

In preparing this textbook, the author has endeavored to coordinate the desires of our engineering teachers as expressed in the surveys conducted by the Society for the Promotion of Engineering Education. The book is intended for undergraduate students majoring in engineering, and calls for a working knowledge of physics and calculus.

✓ ELEMENTS OF SUPERVISION. By W. R. Spriegel and E. Schulz. John Wiley & Sons, New York; Chapman & Hall, London, England, 1942. 273 pp., diagrs., tables, 9½ × 6 in., cloth, $2.25.

Present rapid industrial expansion has created a shortage of trained supervisors and a need for texts that describe the functions of supervisors and methods for training them. The present book meets this need by giving an account of the duties of the position, the problems involved and the ways of meeting them, and of practical methods of training.

✓ HANDBOOK OF BRICK MASONRY CONSTRUCTION. By J. A. Mulligan. McGraw-Hill Book Co., New York and London, 1942. 526 pp., illus., diagrs., charts, tables, 9½ × 6 in., cloth, $5.

The materials used in bricklaying and brick masonry construction are discussed in a practical way and more comprehensively than in any other book. Much information is provided on strength of masonry, on estimating brickwork, on special types and shapes, and on tests. Such topics as underpinning with brickwork, boiler settings, fireplaces and chimneys, paving, swimming pools, and timbrel arches are given special notice.

✓ PHOTOGRAMMETRY, 3 ed. By H. O. Sharp. John Wiley & Sons, New York; Chapman & Hall, Ltd., London, 1943. 129 pp., illus., diagrs., charts, tables, 11½ × 8½ in., cloth, $3.50.

This book provides an exposition of the fundamental principles involved in both terrestrial and aerial photographic surveying, together with a discussion of the application of these principles to map making. The work is intended for use as a text and for office reference. The cameras, instruments, and methods that have proved satisfactory are described. The analytical solution of photogrammetric problems is discussed, as is the use of the photograph in land surveying. Map reproduction is treated in some detail.

RAILWAY ENGINEERING AND MAINTENANCE CYCLOPEDIA, 5 ed. Edited by E. T. Howson and others. Simmons-Boardman Publishing Corp., Chicago and New York, 1942. 1224 pp., illus., diagrs., charts, maps, tables, 12 × 8 in., fabrikoid, $5.

The Encyclopedia is designed to cover thoroughly the best practice of American railways with regard to the materials, devices, and products used in the construction and maintenance of the fixed properties. Sections are devoted to Track, Bridges, Water Service, Signals, and General Topics. Each technical discussion is supplemented by material prepared by manufacturers, discussing their products in detail. The new edition has been thoroughly revised and partly rewritten.

THE PORT OF NEW YORK AUTHORITY (Studies in History, Economics, and Public Law, No. 468). By Erwin Wilkie Bard. Columbia University Press, New York City, 1942. 352 pp., tables, maps, 9 × 6 in., cloth, $3.50.

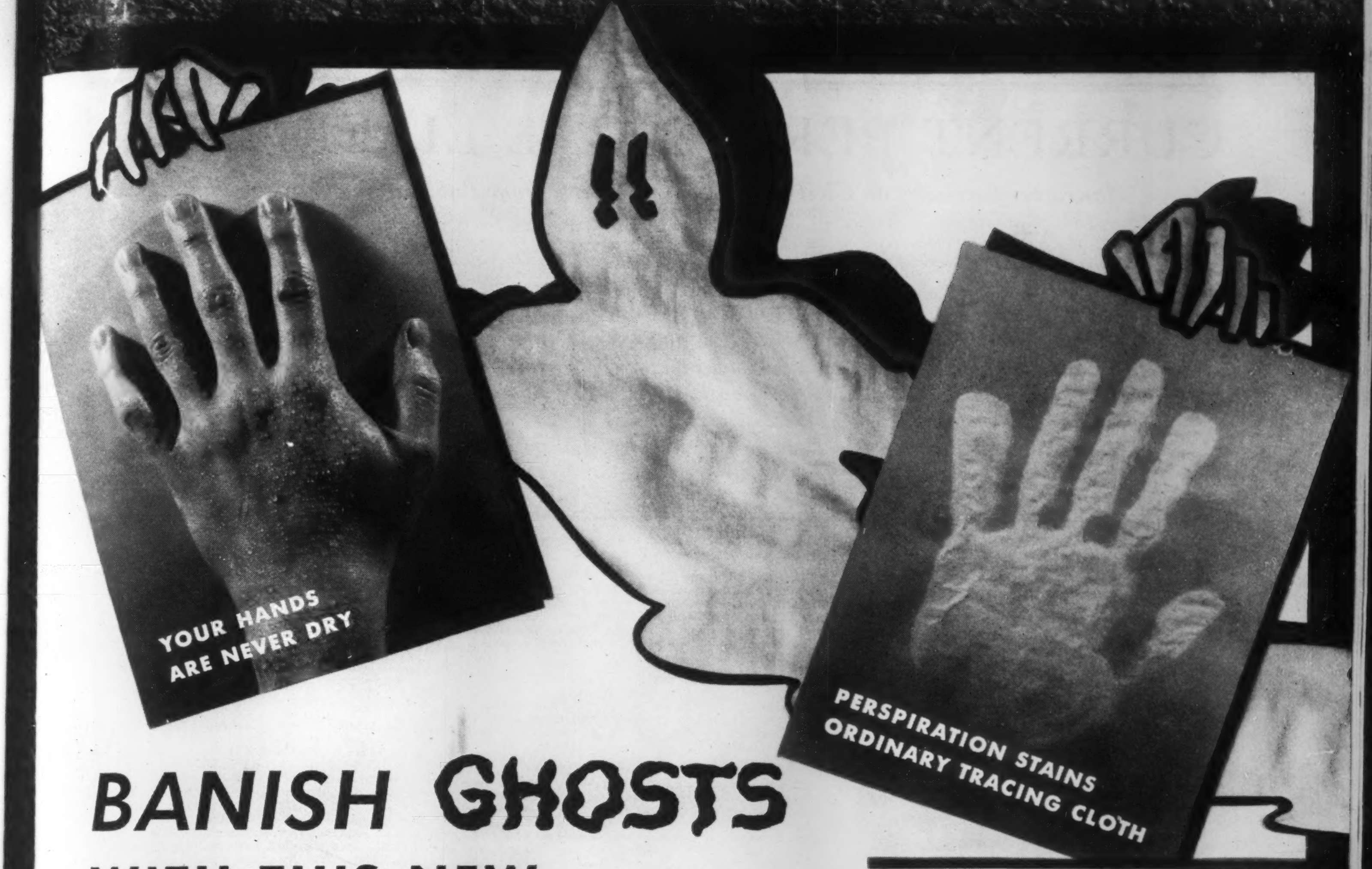
This study may be described as an institutional biography. It is a three-dimensional description and analysis of the Port of New York Authority—its manifold relations to the community, its contributions to the various problems with which it has dealt, and the conclusions that may be drawn from its experience.

STRUCTURAL PETROLOGY OF DEFORMED ROCKS. By H. W. Fairbairn. Addison-Wesley Press, Kendall Square Bldg., Cambridge (Mass.), 1942. 143 pp., illus., diagrs., charts, tables, 11 × 9 in., paper, spiral binding, $5.

The subject of structural petrology has aroused increasing interest during the last decade, and this book is a welcome addition to the small number available. The author presents an up-to-date account of knowledge in this field, with some attempt at interpretation of the facts. The book is intended for experienced geologists and petrographers, not for beginners. There is a full bibliography.

TOWN PLANNING AND ROAD TRAFFIC. By H. A. Tripp, foreword by P. Abercrombie. Edward Arnold & Co., London; Longmans, Green & Co., New York, 1942. 118 pp., diagrs., charts, 9 × 5½ in., cloth, $3.25.

The author, who is Assistant Commissioner of Police at Scotland Yard, has attempted to "review in outline the whole field of traffic direction, its supervision and control, the making and enforcement of traffic law, and the relevant problems of public opinion and psychology, and of town and country planning."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CONCRETE

Construction, Cold Weather. Latest Methods for Winter Concreting, H. F. Ciemmer. *Eng. & Contract Rec.*, vol. 56, no. 1, Jan. 6, 1943, pp. 13–15 and 23. Necessity of speed on wartime construction projects results in development of cold-weather concrete mixing and placing techniques; specification for high early strength concrete presented by Am. Concrete Inst. is discussed.

Construction, Forms. Construction with Moving Formwork, L. E. Hunter. *Concrete & Constr. Eng.*, vol. 37, no. 12, Dec. 1942, pp. 433–446. Usual method of construction with moving or climbing forms is to continue concreting during 24-hour day; in wartime, due to blackout conditions, moving form construction can be carried out only during hours of daylight; hence joint is made at end of each day's work; notes on difficulties encountered as result of this condition and means for their correction.

Floors. Pre-Cast Joists with Wire Reinforcement. *Concrete & Constr. Eng.*, vol. 37, no. 11, Nov. 1942, pp. 400–402. To save steel, concrete floor design has been developed for mass-housing projects in Los Angeles, which keeps cost below that for wood floors with plastered ceilings; no bars are used in floor system; reinforcement in floor is wire fabric, and in pre-cast joists cold drawn wire is used.

Floors. Vacuum Mats and Power Machines Speed Concrete Floor Finish for Navy Warehouses. *Construction Methods*, vol. 24, no. 12, Dec. 1942, pp. 68, 114, and 116. Non-reinforced slab 5 and 6 in. thick is laid on natural soil subgrade and, after 10-min processing with vacuum mats, is finished with gasoline-engine-driven rotary floats and trowels; behind these machines, hand finishers give surface hard troweling; no dust coat is applied.

Industrial Lighting. Increasing Plant Illumination by Use of White Cement Floors. *Aero Digest*, vol. 41, no. 6, Dec. 1942, pp. 234, 288, and 290. Reflection from white concrete floor proved to be 61% better than that from ordinary gray concrete, and vertical illumination from white topped gray by 20%.

Ready Mixed, Indiana. Cheaper to Move Plant to Job, P. J. Pirmann. *Rock Products*, vol. 45, no. 12, Dec. 1942, pp. 70–71 and 81. Ready-mixed concrete corporation has built five plants in Indianapolis, Ind., to cut down mileage of hauls; map showing strategic location of plants.

Roofs. Industrial Plant Addition Uses 100-Ft Movable Forms on Concrete Roof Arches. *Construction Methods*, vol. 24, no. 12, Dec. 1942, pp. 54–55. Plant addition comprises 3 bays, each covered by concrete arch roof; illustrated description of use of movable wood forms for arch roof which was poured in 100-ft sections.

Shrinkage. Some New Facts Concerning Creep in Concrete, R. H. Evans. *Concrete & Constr. Eng.*, vol. 37, no. 12, Dec. 1942, pp. 429–432. Specially designed compressed air-testing machine led author to investigate effect of varying starting point for creep observations on resulting creep-time curves and, at same time, to investigate relation between creep and stress from short-time tests.

Slipways for Seaplanes. Simplified Methods of Building Paved Seaplane Slipways, C. P. Disney. *Roads & Bridges*, vol. 81, no. 1, Jan. 1943, pp. 15–16, and 71. Article describes how seaplane slipways could be built by intrusion or Prepakt method.

Tanks. Big Field Open for Unreinforced Concrete in Industrial Tanks and Basins, H. Moore. *Concrete*, vol. 50, no. 12, Dec. 1942, pp. 2–3. In opinion of author use of unreinforced concrete in design and construction of numerous types of industrial tanks, and for principal features of water purification and sewage disposal plants, has numerous possibilities; several types are illustrated and described.

Tanks. Unique New Concrete Technique Applied to Construction of Water and Oil Storage Tanks, C. Dobell. *Eng. & Contract Rec.*, vol. 55, no. 52, Dec. 30, 1942, pp. 65–66 and 96. Municipal water tank and surface oil tanks are first in Canada built by "Preload" method; construction details.

Temperature Effect. Some Effects of Temperature on Concrete, R. Allin. *Civ. Eng.* (London), vol. 37, no. 436, Oct. 1942, pp. 204–206. Effect of external and internal heating on strength of concrete and bearing on construction work and methods.

Walls, Heat Transmission. Low Transmission of Heat and Cold in Walls of Concrete Masonry. *Concrete*, vol. 50, no. 11, Nov. 1942, pp. 14–15 and 22. Heat transmission of various types of concrete masonry walls based on data obtained in cooperative research sponsored by The American Society of Heating and Ventilating Engineers, The Portland Cement Assn, and University of Minnesota; air space construction; surface finish; insulating materials; coefficients of heat transmission; heat losses other than through walls; insulation of windows.

Water Tanks and Towers. Small Pre-Cast Concrete Storage Tanks Provide "First Aid" Fire Protection. *Concrete*, vol. 50, no. 12, Dec. 1942, pp. 20 and 25. First aid in putting fire out before it has time to get out of control can be provided by means of pre-cast concrete water-storage tanks placed at convenient points around industrial plants, warehouses, and all other types of industrial and mercantile buildings, and kept filled with water; suggested design for concrete tank is shown in line drawing.

DAMS

Concrete Gravity, Arkansas. Norfolk Dam, G. R. Schneider. *Military Engr.*, vol. 34, no. 205, Dec. 1942, pp. 559–563. Complete history of preliminary investigations and site explorations for combined flood control and power generation structure; dam, now under construction, is 2,624 ft long, 230 ft high, and 590 ft above sea level; proposed powerhouse and equipment discussed.

Concrete Gravity, Australia. Somerset Dam, Queensland. *Instn. Engrs. Australia—J.*, vol. 14, no. 10, Oct. 1942, pp. 247–248. Dam is gravity structure, approximately 100 ft long and 163 ft high above general foundation level; it includes central spillway, 250 ft long, to be controlled by eight 16 by 23-ft sector gates.

Earth, Failure. Historic Accidents and Disasters. *Engineer*, vol. 174, no. 4533, Nov. 27, 1942, pp. 432–433 and 435. Account of disaster to Bradfield Dam, Sheffield, on Mar. 11, 1864; one school held that there had been landslip in ground beneath dam; other school thought that disaster was attributable to laying of two outlet pipes beneath dam and erosion produced by leakage from or along them; dam was earthen embankment with puddle core.

Earth, Mississippi. Flood-Control Dam in United States. *Concrete & Constr. Eng.*, vol. 37, no. 12, Dec. 1942, pp. 447–449. Brief note on construction project for Arkabutla Dam of rolled earth-fill type.

Foundations. Engineering Study of Glacial Drift for Earth Dam, Near Fergus, Ontario, R. F. Legget. *Economic Geology*, vol. 37, no. 7, Nov. 1942, pp. 531–556. Record of some of mechanical properties of glacial drift near Fergus, Ontario, based on soil testing carried out during construction of Shand Dam; mechanical testing of samples permitted conclusion that "clay-sized soil particles" behave as granular material; mineralogical examination could be utilized to corroborate this.

FLOOD CONTROL

Flood Damage, Water Works. Emergency Experiences During Flash Floods, B. S. Bush and M. J. Barrick. *Am. Water Works Assn.—J.*, vol. 35, no. 1, Jan. 1943, pp. 81–87, (discussion) 87–92. Report of flood experiences in northern Pennsylvania during 1942, stressing importance of emergency organization in restoring water supplies and insuring their safety; portable equipment used in sterilization of mains and distribution systems.

FOUNDATIONS

Caissons, Welded Steel. Welded Caissons for Naval Dry Docks, C. A. Trexel and A. Amerikian. *Steel*, vol. 111, no. 24, Dec. 14, 1942, pp. 100–102, 104, and 123–127. Details of design and construction of first all-welded caisson; beam 22 ft, depth 54 ft, length 150 ft; typical cross-sectional outlines are given; erection procedure of shop subassemblies; details of welded design; savings in cost, weight, and time realized. From paper winning first grand award in 1940–1942 Industrial Progress Award program, sponsored by James F. Lincoln Arc Welding Foundation, Cleveland.

HYDROLOGY AND METEOROLOGY

Landslides, California. Earth Slide Control, W. Johnson. *Pacific Coast Gas Assn.—Proc.*, vol. 33, 1942, pp. 49–52. Conditions in northern and central California; detrimental effect of earthslides on gas transmission lines; examples discussed; earth slides are caused primarily by loss of stability of natural soil structure; graphic explanation of how shrinkage of top soil, following dry season, may cause formation of crevices, in which water from later heavy rainfalls acts as lubrication to cause earth movement; slide survey procedure; methods of preventive maintenance.

Soils, Stabilization. Vegetative Slope Protection on Access Road Cuts and Fills, L. S. Manning. *Calif. Highways & Pub. Works*, vol. 20, no. 12, Dec. 1942, pp. 2–3 and 20. Principles of vegetative protection of highway cut-and-fill slopes, as outlined by H. D. Bowers (see article indexed in Engineering Index 1942), are being applied to seven military access road contracts under way or recently completed in Monterey County, District V, Division of Highways; method of procedure.

INDUSTRIAL BUILDING

Reinforced Concrete. War Factory Built of Reinforced Concrete. *Eng. & Contract Rev.*, vol. 55, no. 52, Dec. 30, 1942, pp. 60–61 and 88. Constructional details of new Rockfield plant of Canadian Allis-Chalmers Ltd., Lachine, Quebec; to surmount difficulty in obtaining structural steel, reinforced concrete structure was added to existing steel frame factory; feature of design is carrying of 50-ton crane across 52-ft span on reinforced concrete beams 4 ft deep; design of building; lighting; heating.

IRRIGATION

Irrigation in Wartime. Assure Food for War with More Irrigation, J. C. Page. *Pacific Blar. & Engr.*, vol. 48, no. 12, Dec. 1942, pp. 39–40. With proper funds and priorities, water can be brought to two million additional acres by 1945; adding beef for five million persons; powdered milk for seven million per year; irrigation can be extended; priorities speed dams; reclamation projects financially sound.

LAND RECLAMATION AND DRAINAGE

Drainage Pipe. Old C. M. P. Forms Part Circles, C. W. Paige. *Western Construction News*, vol. 17, no. 11, Nov. 1942, pp. 485–486. Salvaged metal culverts from 12 to 20 years old after being removed to make way for channel improvement project were rerolled and used as part circle drains solving priority problem on city street job; manner in which work was carried out.

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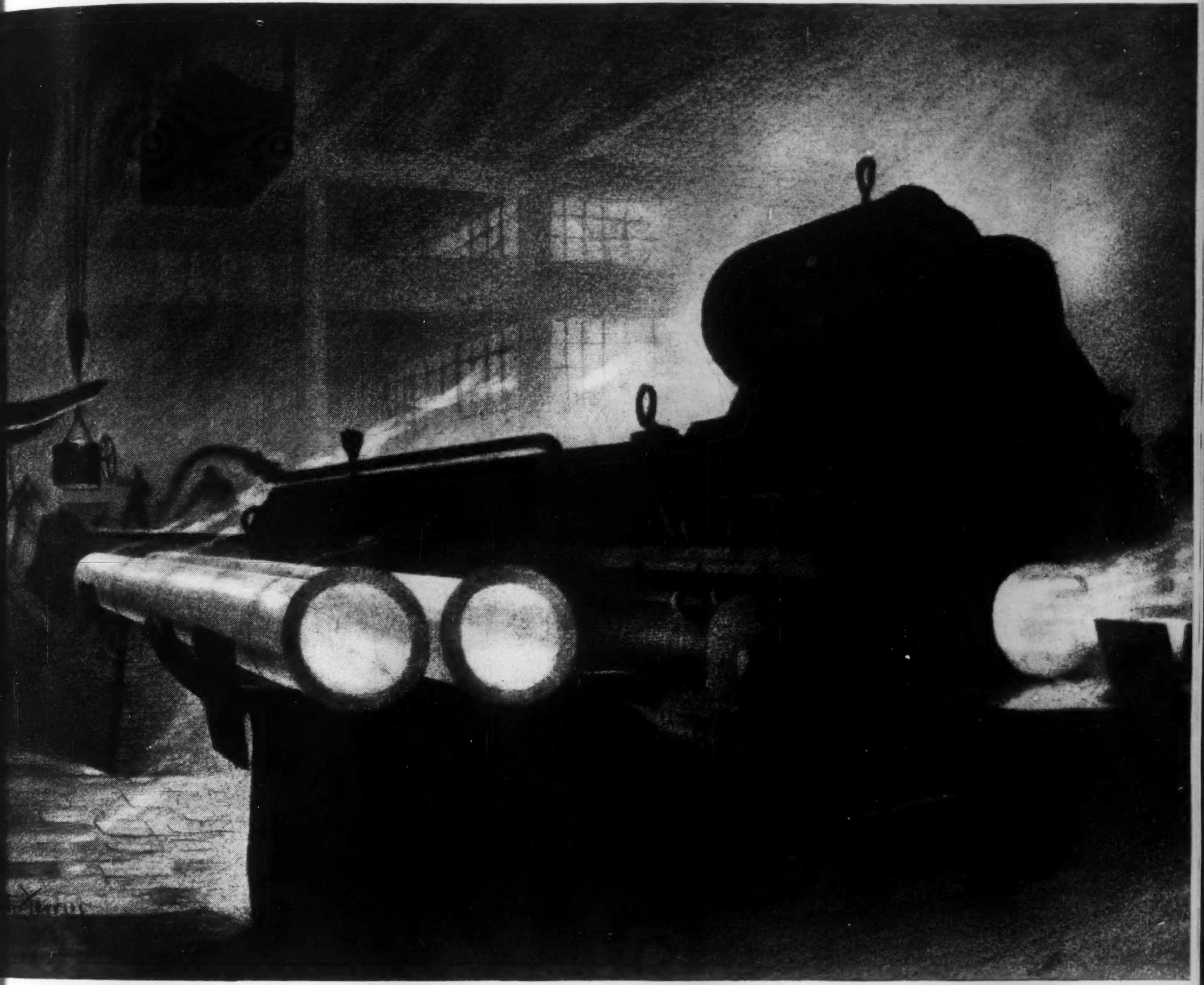

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MATERIALS TESTING

Concrete. Ten-Year Tests of High-Early-Strength Cement Concrete, L. Schuman. *U.S. Bur. Standards—J. Research*, vol. 29, no. 6, Dec. 1942, (RP1508) pp. 397–403. Data on 10-year compressive strengths of concrete cylinders made from 12 commercial high early strength cements are given, supplementing results up to 1 year given in Research Paper 799 (1935); when cured in moist air, concretes generally continued to gain strength between 1 and 10 years; concretes made with some present-day cements may attain strengths in 1 month exceeding those for older cements at 10 years.

Embankments. Some Recent Methods of Investigation of Stability of Earth Slopes, A. R. Oliver. *Instn. Engrs. Australia—J.*, vol. 14, no. 10, Oct. 1942, pp. 235–241. Discussion of density, angle of internal friction, and cohesion as main properties of earth used for statistical investigations for stability; methods of measuring shear strength; safety factor; stressed pore water; movement of water through dams; forces due to seepage water in dams; mathematical methods of analysis.

Road Materials. Stress in Corner Region of Concrete Pavements, M. G. Spangler. *Iowa State College—Eng. Experiment Station—Bul. No. 157*, Sept. 2, 1942, 96 pp. Laboratory stress measurements on corner region of concrete pavement slab are reported; most of measurements were made along three axes through various points, and principal stress was calculated from rosette strains; measurements of pressure between slabs and subgrade, and of deflection of slabs; from these, modulus of subgrade reaction was calculated and information concerning magnitude and distribution was obtained.

Soil Mechanics. Some Fundamental Principles of Soil Mechanics, J. K. Mayer. *La. Eng. Soc.—Proc.*, vol. 28, no. 3, June 1942, pp. 106–124. Discussion of mechanical analysis, Attenberg limits of consistency, and specific gravity as tests to determine soil characteristics; determination of permeability, pressure, and soil stresses as used in foundations and dam design; shear tests and failures; loading tests.

MUNICIPAL ENGINEERING

Present-Day and Post-War Problems. Problems Affecting Our Profession, V. J. Willis. *Instn. Mun. & County Engrs.—J.*, vol. 69, no. 6, Dec. 8, 1942, pp. 197–200, (discussion) 200–206. Present-day and post-war problems; proposed central planning authority; local planning; housing; slum clearance; rebuilding of bombed areas; road safety; sewage and sewage disposal.

PORTS AND MARITIME STRUCTURES

Genoa, Italy. Air Force Targets. *Engineer*, vol. 174, no. 4533, Nov. 27, 1942, pp. 434–437. Illustrated description of design and layout of port of Genoa.

Beaches, Erosion. Beach Protection Measures, W. C. Hall. *Military Engr.*, vol. 34, no. 200, June 1942, pp. 292–296; see also *Shore & Beach*, vol. 10, no. 2, Oct. 1942, pp. 60–64. Brief discussion of forces at work on beaches and structures; present thought on design of beach protective works noted.

Cargo Handling. Port Planning and Terminal Design in Relation to Economical Cargo Handling, H. E. Stocker. *Dock & Harbour Authority*, vol. 23, nos. 264 and 265, Oct. 1942, pp. 142–144, and Nov., pp. 166–169. Port planning and terminal design considered in relation to cargo handling, with particular reference to problems studied by author in Port of Honolulu during 1940 for Matson Navigation Company, supplemented by data from reports on terminal problems elsewhere.

Harbors and Rivers, Railroad Structures. Report of Committee 25—Waterways and Harbors. *Am. Ry. Eng. Assn.—Bul.*, vol. 44, no. 434, Nov. 1942, pp. 129–132. Recommended practices to prevent damage by navigation to movable and stationary bridges and piers, wharves, and docks; abstract of Truman Hobbs Act; navigable waters-abstracts of court decisions.

Seawalls, Design. Design of Sea Walls, C. E. Fellows. *Civ. Eng.* (London), vol. 37, no. 437, Nov. 1942, pp. 232–236. Main points that govern construction of seawalls; considerations affecting type; vertical gravity walls; calculation of earth pressure; foundation pressure; piling reinforced concrete walls.

Shore Protection. New Combination Bank Protection Constructed on Eel River near Dyerville, G. A. Tilton, Jr. *Calif. Highways & Pub. Works*, vol. 21, no. 1, Jan. 1943, pp. 4–5 and 20. Design used was new combination bank protection, consisting of medium rock riprap 2 ft 9 in. thick, normal to $1^1/_2$: 1 embankment slope, and 6-in. by 25-ft flexible rock and wire mattress 5 ft above toe of rock riprap; bank to be protected consisted of alluvial silt extending to depth of 15 ft below stream bed; 35-ft flood height; diagonal velocity developed; flexible mattress effective.

ROADS AND STREETS

Airports, Construction. Tough Airport Grading Job Demands Shop Facilities and Tools for Equipment Maintenance. *Construction Methods*, vol. 24, no. 12, Dec. 1942, pp. 42–45, 96, 98, 100, 102, 104, 106, and 108. Description of work on 9,000,000 cu yd of grading at eastern airport where abrasive boulder clay, impregnated with hard round stones, took heavy toll of all types of construction equipment.

Concrete. British Standard Specification of Concrete Road Slabs, J. H. Walker. *Concrete & Constr. Eng.*, vol. 37, no. 11, Nov. 1942, pp. 413–418. Comments on British Standards Institution published instructions, dated May 4, 1942, for making concrete surfacings in wartime; it is author's belief that minimum requirements stated therein necessitate unwarranted extra cost and time of construction, combined with lack of efficiency; suggestions of Road Research Laboratory and Ministry of War Transport included.

Culverts, Design. Culvert Entrances and Headwalls on California Highway System, R. L. Thomas and G. A. Tilton, Jr. *Calif. Highways & Pub. Works*, vol. 20, no. 12, Dec. 1942, pp. 4–8. Consideration of entrance conditions involving headwalls and endwalls and appurtenances and their effect on hydraulic efficiency of culvert.

Detroit. Transit Crisis Drafts Wartime Street Project. *Am. City*, vol. 57, no. 12, Dec. 1942, pp. 62–63. Brief description of new $1,400,000 limited traffic way, now being completed in Detroit, which will play vital part in carrying essential war materials and workers in this congested area.

Flight Strips. Considerations in Construction of Flight Strips, F. E. Schnepfe. *Aero Digest*, vol. 41, no. 6, Dec. 1942, pp. 222, 225–226, and 294–296. Post-war flight strip program is intended to provide landing facilities for civilian flier, basic landing facilities for small cities or groups of towns for air-feeder service and air cargo, and auxiliary landing facilities for all types of airplanes.

Gravel. Volcanic Cinders Suitable for Use in Base Course Construction, E. A. Willis, H. Aaron, and R. C. Lindberg, Jr. *Pub. Roads*, vol. 23, no. 6, Oct.-Nov.-Dec. 1942, pp. 125–135. Survey made to obtain information on service behavior of volcanic cinder roads in Arizona and to correlate road condition with physical characteristics of cinders as determined by laboratory tests; laboratory and circular track tests were made on cinders from five sources in Arizona and on "tufa" gravel; results discussed.

Highway Engineering, Wartime. Carrying on in Wartime, A. W. Hinderman. *Better Roads*, vol. 12, no. 12, Dec. 1942, pp. 11–12, and 16. Problems faced by rural county in Iowa, with reference to highway construction and maintenance.

Highway Systems, Alaska. Strategic Route to Alaska, S. A. McMillion. *Military Engr.*, vol. 34, no. 205, Dec. 1942, pp. 546–553. Problems of selection of route for Alcan Highway; construction and supply problems; proposed operation of road.

Highway Systems, Australia. 1,000-Mile Wartime Highway In Australia, A. Olsen. *Roads & Streets*, vol. 85, no. 12, Dec. 1942, pp. 30–32. Constructional details of all-weather road that runs through center of Northern Territory from Alice Springs to Larrimah; road was opened in Sept. 1940.

Highway Systems, Pan-American. North to Fairbanks—South to Rio, R. B. Hall. *Compressed Air Mag.*, vol. 47, no. 11, Nov. 1942, pp. 6877–6883. Narrative and descriptive account of progress of construction in various countries of North and South America.

Highway Systems, Pan-American. Pan-American Highway—World's Greatest Road Job, E. W. James. *Eng. & Contract Rec.*, vol. 56, no. 2, Jan. 13, 1943, pp. 8–10 and 19–20. Details pertaining to Pan-American Highway System; completion of final links will permit overland flow of South American raw materials to United States and Canada; ship losses in Atlantic emphasize strategic value of vast road network; present transportation situation; alternative land and water routes; facilities and supplies; relative costs; proposed solution.

Maintenance and Repair. Maintenance of Highways in Wartime, R. H. Baldock. *Pacific Bldr. & Engr.*, vol. 49, no. 1, Jan. 1943, pp. 38–39. How State of Oregon has dealt with wartime problems; women to be trained to operate maintenance equipment; asphalt to be stored in underground tanks; smooth roads essential to conservation of rubber; repair parts necessary.

Maintenance and Repair. New Ideas and Methods Ensure Adequate Wartime Road Maintenance, R. H. Stekette. *Eng. & Contract Rec.*, vol. 56, no. 2, Jan. 13, 1943, pp. 14–16. Phases of maintenance and highway service discussed separately—i.e., grade and drainage; structures; road surfaces; markers and signs; utilities. Before 28th Annual Highway Conference of College Eng., Univ. of Mich.

Testing. Michigan Test Road Provides for Extensive Study of Highway Joints. *Concrete*, vol. 50, no. 12, Dec. 1942, pp. 4–6. Test road consists in reality of two test projects: one has length of 10.1 miles and was built to provide for study of many principles and factors incidental to design and construction; remaining 7.7 miles is for study of factors involved in durability of concrete; notes on joint spacing and design, expansion joints, and contraction joints with load transfer.

SEWERAGE AND SEWAGE DISPOSAL

Chlorination. Modern Trends in Chlorination of Sewage, A. E. Griffin. *Eng. & Contract Rec.*, vol. 55, nos. 45 and 51, Nov. 11, 1942, pp. 20–22, and Dec. 23, pp. 10–12 and 20–21. Composition of sewage; upstream treatment; sedimentation; Imhoff tanks described; chlorination ahead of aeration tanks; bulking sludge; cleaning diffuser plates; grease removal; chlorine and chemical precipitation; sewage effluents and chlorination; potential chlorination. Before Can. Inst. Sewage & Sanitation.

Disposal Plants, Circleville, Ohio. Fitting Chemical Precipitation to Sewage-Treatment Plant, E. F. Leist. *Am. City*, vol. 58, no. 1, Jan. 1943, pp. 47–49. Methods used at Circleville, Ohio, plant, for treatment of sewage by chemical precipitation plant operation; vacuum filter used; treatment without chemicals; laboratory results; chemical treatment.

Disposal Plants, Fairport, N.Y. Incinerator and Sewage Plant Operated Jointly, F. A. Cary. *Pub. Works*, vol. 74, no. 1, Jan. 1943, pp. 28–29 and 38. Village of Fairport, N.Y., burns its refuse in 18-ton incinerator, located at sewage plant, which is operated by sewage attendants and heats digester; detailed description of incinerator.

Disposal Plants, Great Britain. Extensions to York Sewage Disposal Works, D. Parker. *Surveyor*, vol. 101, no. 2651, Nov. 13, 1942, pp. 387–388. Details of extensions to plants which have been designed for population of 120,000; bacteria beds, humus tanks, sludge digestion, and drying beds are discussed. Before Instn. Mun. & County Engrs.

Disposal Plants, New York City. Operation of Wards Island Sewage Treatment Plant, G. P. Edwards. *Boston Soc. Civ. Engrs.—J.*, vol. 29, no. 3, July 1942, pp. 229–239. Operating details of Wards Island Activated Sludge Plant, New York City; operating summary and record of plant efficiency for 1940 shown in table; plant was built to relieve pollution in river and harbor waters.

Disposal Plants, Tifton, Ga. Guarding City's Health with Sewage Treatment, D. H. Hurst. *Am. City*, vol. 57, no. 12, Dec. 1942, pp. 38–39. Tifton, Ga., overcomes unusual sewerage problems in 3-year operation of its treatment plant.

Great Britain. Continuous Flow Sedimentation in Treatment of Sewage, L. B. Escritt. *Surveyor*, vol. 101, no. 2656, Dec. 18, 1942, pp. 433–437. Critical discussion of British practice of sewage treatment with discussion of modern scientific methods; theories of sedimentation; turbulence; settlement of detritus; flocculation; inlet effect; velocity of horizontal flow and scour; detention periods; design of sedimentation tanks; sludge removal; washout pipes. Bibliography. Before Inst. Sewage Purification.

Great Britain. Sewage Purification Services in Relation to National Post-War Planning. *Surveyor*, vol. 101, no. 2654, Dec. 4, 1942, pp. 417–418. Digest of memorandum submitted by Inst. of Sewage Purification, concerning possible reorganization of sewage purification services in connection with post-war reconstruction; works design, construction, and operation included.

Great Britain. Treatment of Sewage on Percolating Filters at Huddersfield. *Surveyor*, vol. 101, no. 2655, Dec. 11, 1942, pp. 425–426. Abstracts of two papers before Inst. Sewage Purification: Paper by H. H. Boldthorpe deals mainly with chemical aspect of investigations, and that by J. Nixon discusses biological observations.

Hydrated Lime. Hydrated Lime in Sewage Treatment, W. Rudolfs and W. A. Moggio. *Pub. Works*, vol. 74, no. 1, Jan. 1943, pp. 11–13, 49, and 51. Some of properties of hydrated limes and their effects on sewage clarification and coagulant demand; functions of hydrated lime are considered to be mainly to neutralize acidity, to adjust pH values of sewage to optimum range for coagulation, and to act as coagulating chemical.

Recent Developments. Some Recent Developments in Biological Treatment of Settled Sewage, M. Lovett. *Surveyor*, vol. 101, no. 2650, Nov. 6, 1942, pp. 381–383. Discussion of recirculation processes, land treatment, and intermittent sand filtration, and activated sludge processes. Before Inst. Sewage Purification.

STRUCTURAL ENGINEERING

Columns, Stresses. Determination of Stresses in Columns Caused by Combined Bending and Compression, L. E. Hunter. *Concrete & Constr. Eng.*, vol. 37, no. 11, Nov. 1942, pp. 391–399. To avoid labor involved in solving cubic equation for neutral axis depth ratio when calculating stresses in members submitted to combined bending and compression, it is common practice

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FIELD REPORT

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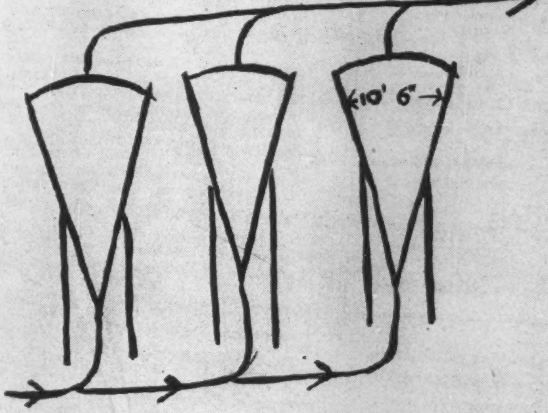

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WATER ANALYSIS	RAW WATER	SPIRACTOR EFFLUENT#
Total Hardness	180	40
Calcium Hardness	172	32
Alkalinity A (Methyl Orange)	180	40
Alkalinity B (Phenolphthalein)	0	20
Free Carbon Dioxide	20	0

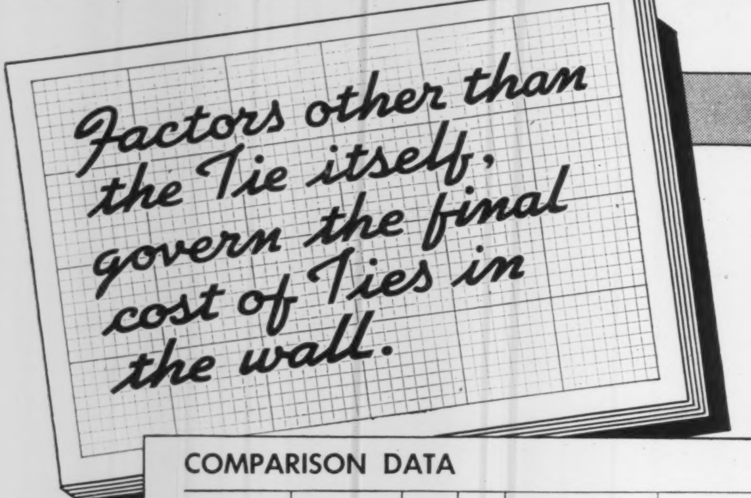
#Before filter

Write for free bulletin to The Permutit Co., Dept. A14, 330 West 42nd St., New York, N. Y. In Canada: Permutit Company of Canada, Ltd.... Montreal... Toronto... Winnipeg... Calgary

PERMUTIT

WATER CONDITIONING HEADQUARTERS

FORM-TY ENGINEERING FACTS


Factors other than the Tie itself, govern the final cost of Ties in the wall.

COMPARISON DATA

SYSTEM	TIE	Safe Load	Tie Length	Weight per Unit			Cost per Unit		
				Tie Only	Working Parts	Total	Tie Only	Working Parts	Total
Prefabricated	½" Tyscrus	6000#	10"	.34#	2.94#*	3.28#	$.08	$ .31	$ .39
	A.C.Form-Tys	3000#	29¼"	.38#	1.73#(	2.11#	$.05	$ .18	$ .23
	Snap-Tys	3000#	29¼"	.38#§	1.44#	1.82#	$.05	$ .14	$ .19
Field-Assembled	Band Iron	1500#	36"	.39#	.86#†	1.25#	$.03	$ .20	$ .23
	½" Rod & Clamps	5000#	36"	2.0#	3.62#†	5.62#	$.08	$ .60	$ .68
	⅜" Tilt Lock	5000#	10"	.32#	8.5#†	8.22#	$0.325	$1.45	$1.4825

§ Includes built in spreader unit.
(Includes Spreader Plates for Form Spreading.
† No provision for spreading forms.
* Includes Tycones for Form Spreading (Opt.)

Weight; the number of ties required; investment and depreciation on working parts; erecting and stripping time; labor required for "on the job" preparation; safety margins which must govern operating schedules—these determine the cost of your concrete form work. With Richmond's Form-Ty Engineering you get specific advantages in every one of the above-mentioned items. The comparison data shown above gives you an idea. For instance, why pay 68c when 38c is enough? Reach for your Architects or Engineering File and get the whole story in Richmond's Form-Ty Engineering Guide. Or, write us for your individual copy. Better still, let us look at your job plans and give you exact figures.

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TIME AND LABOR SAVING CONSTRUCTION DEVICES FOR CONCRETE CONSTRUCTION

to use graphs; even with their aid, however, determination of stresses requires a certain amount of calculation which it is object of present article to reduce.

DOMES AND SHELLS, STRESSES. Torsion Analysis of Open Shell Structures, E. H. Spaulding. *Product Eng.*, vol. 13, no. 12, Dec. 1942, pp. 718–721, and vol. 14, no. 1, Jan. 1943, pp. 25–27. Mathematical analysis of stress distribution in shell structures; application of analysis to illustrative example, with data obtained from experimental structure that was subjected to stress distribution test; theoretical calculations and test results are listed and compared. Bibliography.

INDUSTRIAL PLANTS, DESIGN. Designing Factory Structures to Save Steel. *Eng. & Contract Rec.*, vol. 56, no. 1, Jan. 6, 1943, pp. 18–20 and 24. Results of study made to determine types of roof construction, use of which involves least amount of steel; overall design of steel mill buildings, from roof to footings; 14 different types of roof construction studied in connection with 3 different spans of roof trusses; some studies of timber mill buildings are also included. From report by Specifications Branch, Conservation Div., U.S. War Production Board.

FRAMED STRUCTURES. Analysis of Rigid Frames by Moment Distribution, G. B. Godfrey and J. G. Shilston. *Instn. Mun. & County Engrs.—J.*, vol. 69, no. 6, Dec. 8, 1942, pp. 181–196. Details of moment-distribution method of rigid-frame analysis; basic principles are evolved and method developed; various worked examples are given.

ROOFS, AIR-SUPPORTED. Air-Supported Roofs for Factories, H. H. Stevens. *Arch. Rec.*, vol. 92, no. 6, Dec. 1942, pp. 45–46. Roof of factory described is thin, steel membrane constructed with insulation and roofing flat on ground and fastened to concrete anchor ring; it is then raised and stretched into dome shape by air pressure from ordinary ventilating blowers, and thereafter is supported by pressure of 1 oz per sq in. from these blowers; effect of pressure on occupants is negligible; working area is completely free of columns and other structural obstructions.

STATICALLY INDETERMINATE STRUCTURES Statically Indeterminate Structures, R. Gartner *Concrete & Constr. Eng.*, vol. 37, nos. 7, 8, 9, 11 and 12, July 1942, pp. 265–273; Aug., pp. 299–303; Sept., pp. 340–344 and 346–350; Nov. pp. 406–412; and Dec., pp. 450–461. Reinforced concrete structures are usually monolithic and are therefore indeterminate systems; methods which can be adopted with advantage in design of these systems are demonstrated. (To be continued.)

WAREHOUSES, DESIGN. Large Warehouse in United States. *Concrete & Constr. Eng.*, vol. 37, no. 11, Nov. 1942, pp. 419–421. To reduce cost and construction time of 540 by 1,400-ft storage warehouse for military purposes, rain water will be impounded on roof until it evaporates.

TUNNELS

AIR-RAID PRECAUTIONS, SHELTERS. Deep Tunnel Air Raid Shelters. *Engineer*, vol. 174, no. 4533, Nov. 27, 1942, pp. 445–446. Supplementing description indexed from Sept. 18, 1942, issue of same journal, further details are given as to arrangement of these shelters and methods by which they were constructed.

COAL MINES. Driving 2,600-Foot Rock Tunnel with Shaking Conveyors at Reliance, J. E. Willson. *Rocky Mt. Coal Min. Inst.—Proc.*, 1942, pp. 23–25, (discussion) 25–26. Features of five seams in which mining is feasible, on property at Reliance, Wyo.; underground and surface transportation conditions; reasons for adoption of rock tunnel from upper end of tram. line to No. 11 seam; details of driving 8 by 12-ft tunnel, 300 ft as open cut and cover, 2,071-ft straight rock tunnel, then widened and with curved wings north and south to coal seam; grade 0.7%.

CONSTRUCTION. Modern Tunnelling Practice, R. Hammond. *Engineer*, vol. 174, no. 4528, Oct. 23, 1942, pp. 344–345. Discussion of problems of lining large tunnels and safety features.

SUBWAY CONSTRUCTION, CHICAGO, ILL. Shield Tunnels to Chicago Subway, K. Terzaghi. *Boston Soc. Civ. Engrs.—J.*, vol. 29, no. 3, July 1942, pp. 163–210. Shield tunnels comprise 2 miles of single-tube tunnels, station sections included; soil conditions; method of tunnel construction; influence of size of openings on resistance against shoving and heave of street surface; resistance against shoving and movement of street surface; effect of shield shoving on buildings; design of tunnels; observations on experimental section and their bearing on design of shield tunnels.

WATER PIPE LINES

MAINTENANCE AND REPAIR. Plans for Emergency Distribution System Repairs in San Francisco, G. W. Pracy. *Am. Water Works Assn.—J.*, vol. 35, no. 1, Jan. 1943, pp. 69–70. Outline of organization of maintenance crew of San Francisco Water Dept. and plans for defense and maintenance of its system.

WATER RESOURCES

MAINTENANCE AND REPAIR. Emergency Repair of Distribution Systems, W. V. Weir. *Am. Water Works Assn.—J.*, vol. 34, no. 8, Aug. 1942, pp. 1205–1213. Outline and discussion of step to be followed when emergency repairs of distribution systems are needed; equipment to speed repairs; mechanical joint repair fittings; wood plugs for temporary repairs; sterilization of repaired mains; augmentation of repair personnel.

WATER TREATMENT

ALUM. Use of Emergency Alternate Specifications Alum, F. E. Stuart. *Am. Water Works Assn.—J.*, vol. 35, no. 1, Jan. 1943, pp. 34–36. Due to suspension of specifications for "Sulfate of Alumina," various problems will be presented to water works operators in use of new type of alum; article explains conditions that may result and difficulties expected and discusses their causes and cures.

CHLORINE DETERMINATION. New Method of Determining Residual Chlorine, H. C. Marks and J. R. Glass. *Am. Water Works Assn.—J.*, vol. 34, no. 8, Aug. 1942, pp. 1227–1240. Details of new method which consists of titrating chlorine amperometrically with sodium arsenite in neutral solution using polarized gold electrode and silver chloride reference electrode. Bibliography.

HAWAII. Honolulu Wartime Water Works Activity, F. Ohrt. *Am. Water Works Assn.—J.*, vol. 34, no. 8, Aug. 1942, pp. 1141–1162. General details of source and distribution of water in Honolulu; protection of distribution system and war preparation which have been made; emergency stores and appropriations; defense training of employees; precautions against gas attack.

LIMESTONE. Water Treatment with Limestone, C. H. Connell, P. J. A. Zeller, and J. H. Sorrels. *Texas Agric. & Mech. College—Eng. Experiment Station—Bul.*, vol. 12, (4 series), no. 18, Dec. 15, 1941, pp. 5–52. Methods of removing carbon dioxide, iron, and manganese from water with limestone; survey of deposits and collection of samples; processing and analyzing samples; calcining experiments; laboratory tests with powdered stones; filter-bed experiments.

PROTECTION. Guarding Water Works Property, W. J. Scott, H. U. Fuller, and W. W. Hurlbut. *Am. Water Works Assn.—J.*, vol. 34, no. 8, Aug. 1942, pp. 1163–1172. Review of problems encountered and measures which have been taken to protect water supplies and property in wartime in Connecticut, Portland (Me.), and Los Angeles.

Why Chromium is used in

ENGINEERING STEELS

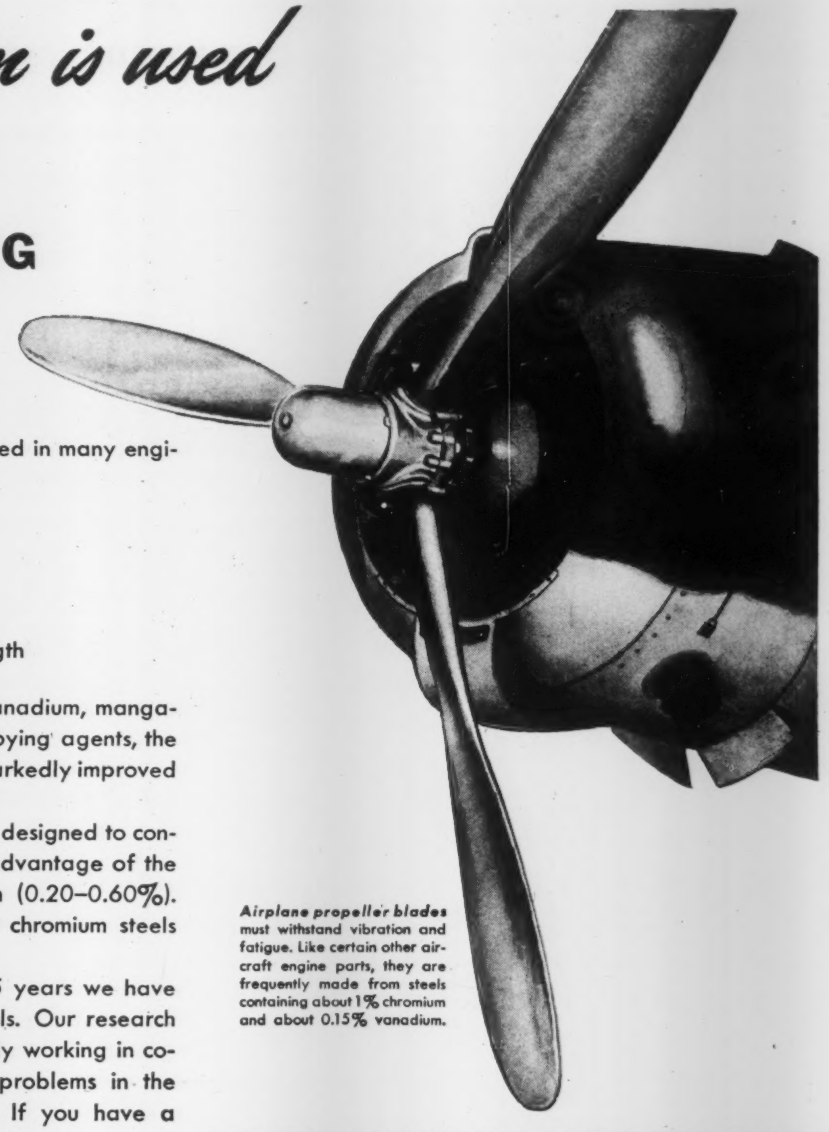
Small amounts of chromium (0.2–2.0%) are used in many engineering steels because chromium increases—

- Hardenability
- Toughness
- Impact Resistance
- Wear Resistance
- Ductility at high tensile strength

Alone, or in combination with nickel, silicon, vanadium, manganese, molybdenum, zirconium, boron, or other alloying agents, the use of chromium in engineering steels produces markedly improved steels well suited for the tough jobs of industry.

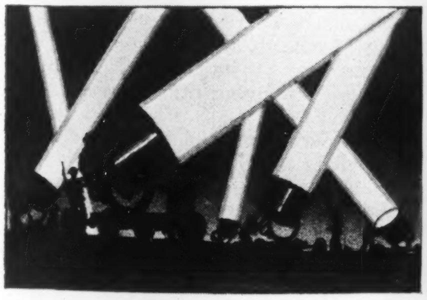
Most of the new National Emergency steels . . . designed to conserve these critical alloying elements . . . take advantage of the beneficial effects of small amounts of chromium (0.20–0.60%). For many special applications, however, higher chromium steels are used.

We do not make steel, but for more than 35 years we have produced ferro-alloys used in making alloy steels. Our research laboratories and service engineers are continually working in cooperation with steel producing companies on problems in the development and manufacture of alloy steels. If you have a problem in the selection or use of alloy steels, call on us.

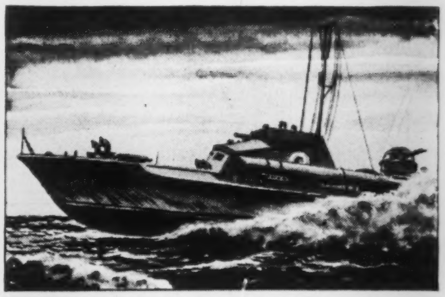


Airplane propeller blades must withstand vibration and fatigue. Like certain other aircraft engine parts, they are frequently made from steels containing about 1% chromium and about 0.15% vanadium.

BUY UNITED STATES WAR BONDS AND STAMPS



Ball Bearings for equipment that must move freely and quickly must resist abrasive wear, and keep true shape. Most precision ball bearings are made of 1.2-1.5% chromium steel with 0.2-0.5% manganese.



Marine Engine Crankshafts for patrol vessels take a terrific pounding. Men's lives depend on their durability and strength. These crankshafts are frequently made from a 1.0% chromium steel with manganese, nickel, and molybdenum.

Truck Gears must be tough, durable and wear resistant. Gears, steering knuckles, springs, pinions, and many other truck parts are now being made from steels containing up to 1% chromium with less amounts of other elements.

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Equipment, Materials, and Methods

New Developments of Interest, as Reported by Manufacturers

Goggles for Gas Welders

DEVELOPMENT OF A NEW eye-protection glass—Didymium-Noviweld—which permits eyes of gas welders to pierce blinding glare and see welding operations from beginning to end, is announced by The American Optical Company, Southbridge, Mass. Previously the glare of flame-welding made it impossible for welders to see exactly what they were doing—a factor which materially slowed up welding.

In all types of flame-welding, the new Didymium-Noviweld safety goggle lenses cut down the high intensity sodium rays of the fluxes. Flame workers can thus look right through the yellowish cloud of "flux-flare," see the rod and the molten wire more clearly, and thereby step up their efficiency in every phase of the welding operation, particularly the flame welding of aluminum and steel. The lenses also protect eyes by absorbing the harsh, tiring, invisible ultra-violet and infra-red rays generated during welding. Noviweld-Didymium lenses are manufactured under strict laboratory control, and meet the Bureau of Standards specifications for glare control. Three shades are available for immediate delivery, numbers 4, 5 and 6, corresponding with shade numbers of the standard AO Noviweld lenses.

Heavy Wear Electrode

TOURNAWELD RW (Roller-Weld), specially developed for use in building up track rollers, rails, and other similar parts of machines subjected to a combination of impacts and heavy bearing wear, is being introduced by R. G. LeTourneau, Inc., Peoria, Ill. It is reported that this new electrode is characterized by rapid burn-off, smooth operation, and uniform deposit of highly alloyed, tough, hard surfacing metal which is sufficiently soft in the as-deposited condition to be ground. Tournaweld RW (Roller-Weld) operates with greatest efficiency on reverse polarity with a DC welding machine. The rod is black in color and comes 14 in. long in diameters of $^5/_{32}$, $^3/_{16}$, and $^1/_4$ in. It has been thoroughly field tested.

Screw Stem Gate Hoist

THE RODNEY HUNT MACHINE COMPANY of Orange, Mass., has recently designed a completely new line of floor stand hoists for screw stem gates as used on canals, reservoirs, and other water controlling projects. The new types are compact, strong and easy to operate. They make use of gears, efficient seals and compact anti-friction bearings. The handles are removable. These new Rodney Hunt Hoists have selective two-speed gear ratios, and permit the gates to be stopped and held at any stage of opening.

Truck Mounted Ditcher

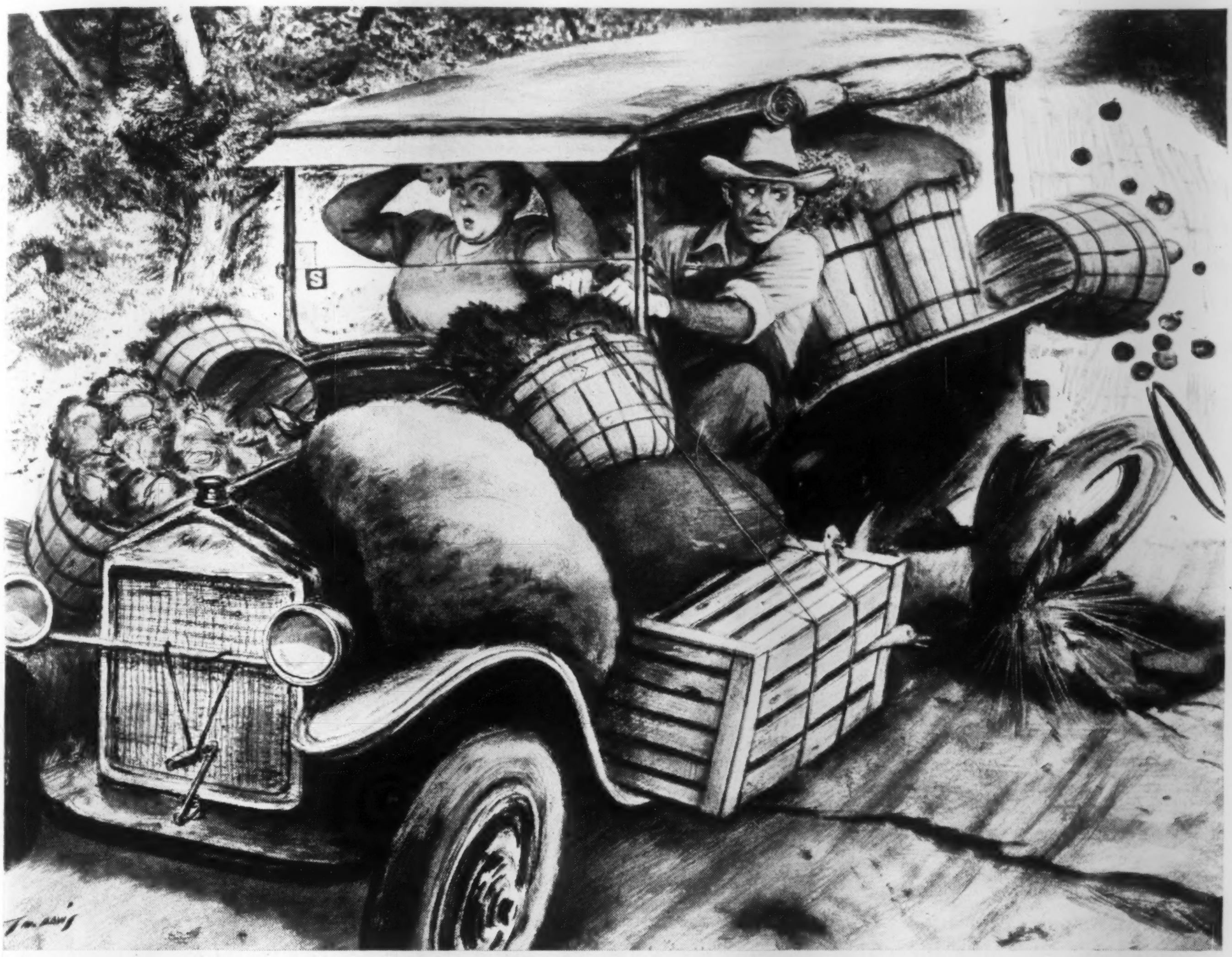
A RECENTLY DEVELOPED UNIT for the maintenance of ditches along all types of highways is the "Hystevator" Ditcher. The ditcher consists essentially of a demountable frame or bracket, a hoist and drag line scoop bucket. It can be used on any standard make of truck, requires no separate power plant or power take-off, does not interfere with dumping, nor cut down truck capacity, is quickly installed or removed.

The manufacturer states that when the "Hystevator" is used, the average output of the standard maintenance crew of a truck driver with two men is from twenty to thirty loads per day. One man operates the bucket in the ditch, the driver remains in the truck, and the third man trims the ditch by hand for improved appearance. The latter is often dispensed with, and two men do approximately three times the work ordinarily done by three men.

In addition to its principal use for cleaning and trimming highway ditches, the "Hystevator" is also used for loading oil rock from maintenance stock piles, loading barreled oil, removing boulders from ditches, loading boulders for rip-rap work, and for loading miscellaneous material or equipment into dump trucks or flat bed trucks. Details from Williamette Hyster Company, Portland, Oregon.

Drawing Board Refacer

A RESILIENT SURFACING MATERIAL for refacing drawing boards has been placed on the market by W. H. Long Co., 425 North Clark St., Chicago, Ill. This material—the No-ink Drawing Board Top—presents a drawing surface which is washable, wearproof and scratchproof, according to the manufacturer. Further details and the free trial offer are given in the literature of the company.



How much does a good pot-hole cost?

TINKERED and humored into lasting far beyond its time, this venerable cargo jalopy may not look important, but it is! It carries food enough for several hundred fighting men and workers — fo that may be delayed or lost by the wayside bec of a pot-hole in the road.

How much does a good pot-hole cost? " brother, plenty!" say men who know. F of trucks daily ply our highwa from farm to market and plant, over

R easingly

Tarvia and right

nance

THE above is taken from a Barrett Tarvia advertisement in The Saturday Evening Post—a message telling American people of the vital war-time importance of road maintenance and repair.

Today millions of trucks ply our highways and back roads, from farm to market, and from mine and mill and plant. And many more millions of automobiles carry industrial workers to and from their jobs.

Roads that need repair can take an increasingly serious toll from this vital traffic. There's no calculating what they cost in excessive wear to tires and damage to cars, in accidents, delays and lost man-hours. Neglected pot-holes grow steadily bigger, steadily more dangerous and increasingly difficult to repair.

That is why it is so vitally important to concentrate upon *maintenance* in 1943. Highway engineers and officials are having to make limited appropriations and supplies work overtime. Why not discuss your problems with the Tarvia field man? He can help you make a little do the work of a lot. Remember; there's a right type of Tarvia and a right Tarvia method for the maintenance and repair of almost every type of road.

*Trade-mark Reg. U. S. Pat. Off.

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Barrett Tarvia*

WOOD Is Still Best For Jobs Like This

THE RAILROADS are among the earliest and most consistent users of Wolmanized Lumber*. Bridge timbers, stringers and ties, wharf and platform decking—life is tough on jobs like these. But this wood is "alloyed for endurance," armed against decay and termite attack, so it can take it.

RESILIENCE, the cushioning effect between trackbed and supporting steel, is retained where Wolmanized Lumber is used in structures like that illustrated above. This wood also offers light weight, ease of handling and erection, high strength. It is clean, odorless, paintable. There is no added fire hazard, and the wood is not corroded by brine drippings from refrigerator cars. Nor does it corrode its metal fittings.

SERVICE RECORDS covering millions of feet of Wolmanized Lumber, at work for the railroads and elsewhere in industry, provide evidence of its durability. Lasting ability is given ordinary wood by vacuum-pressure impregnation with Wolman Salts* preservative. "Fibre fixation" prevents leaching out.

WOLMANIZED LUMBER is being employed for wartime structures all over the world, speeding erection, assuring long life. It will do the same for your peacetime construction. American Lumber & Treating Company, 1654 McCormick Building, Chicago, Ill.

*Registered Trade Mark

"Alloyed" FOR ENDURANCE

WOLMANIZED LUMBER

Gratings Become Highways

A NEW TECHNIQUE in the construction of highways consists of laying steel grating mats and filling the meshes with sand. The only binder necessary to keep the sand confined in the mesh is oil sprinkled on the surface. The gratings are similar to the portable emergency landing mats—"pocket airfields" being manufactured for the air forces.

Our fighting forces in all arenas of war have been making use of the steel mats in this manner, it is reported by the Irving Subway Grating Company, Long Island City, N.Y. It has been found that the gratings make effective roadways even when laid on sandy beach or on farm land, plowed and harrowed. Panels are laid side by side and end to end and attached to each other by slip rings fitting over the tongues of adjacent panels. Implements required are a hammer and a simple pronged tool. On its own proving grounds, the Irving Company has effective proof of the permanence of the surfacing. Fourteen years ago, similar surfacing, filled with sand and sprinkled with oil binder, was laid. With absolutely no maintenance work, loss of sand between the mesh has been practically negligible and there have been no signs of corrosion. This surfacing was laid over a seldom-used dirt road, but subsequently was given hard punishment with trucks and other vehicles. Further examples and more complete data will be supplied by the manufacturer.

Solving Specific Corrosion Problems

A NEW, CORROSION DATA work sheet has been designed to assist executives and engineers in their study of corrosion problems. The Work Sheet acts as a check list to insure consideration and evaluation of all factors influencing a corrosive action. It also permits ready comparison of a problem with similar ones which may be used as a guide for selecting materials possessing a satisfactory resistance. This form distributed by The International Nickel Company was developed by its Technical Service as a result of extensive experience with corrosion data inquiries that inadequately described conditions for which recommendations were sought.

When problems involve corrosives or operating conditions not previously encountered, The International Nickel Company's Technical Service invites plant men to submit completed Work Sheets for interpreted data from its Corrosion Data Files of over 2,000 plant tests on approximately 40,000 metal specimens. These data are not limited to Monel, nickel and Inconel but also include those for a wide range of construction materials and their relative performances against a host of corrosives and service conditions. Only corrosion data developed through confidential arrangement will be withheld from this offer. Copies of the Corrosion Data Work Sheet may be obtained without charge from Technical Service, The International Nickel Company, 67 Wall St., New York, N.Y.

"O BRAVE NEW WORLD..."

The shortest distance between two points is . . . a curved line across the top of the world! Short cut sky lanes to Bombay, Chungking, Moscow, Tokio, Sydney, Cape Town rise high above vast seas of glittering, icy wastes. Sky lanes—now being charted by the post-war planners of America. Sky lanes that bring our very farthest neighbor to us in no more than 60 hours.

Tomorrow's new world lies in the palms of the draftsmen of today. They are linking country to country, continent to continent. And in this tremendous project, as in every other important blueprinting work, *Typhonite ELDORADOS lead all other drawing pencils with their decisive clarity, uniform degrees, opacity and speed. *Typhonite* ELDORADOS are helping to plot our brave new world.

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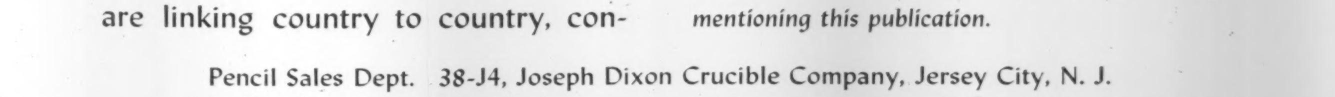

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Rigid adherence to high quality ingredients . . . close laboratory control . . . careful manufacture in modern, instrument-controlled equipment . . . these, in part, account for the consistent uniformity of RITECURE.

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4-JM-2

All-Position Electrode

A new electrode designed specifically for all-position welding of mild steel with A-C type welding machines has been developed by Air Reduction Sales Company in the diameters of $^{1}/_{8}$ and $^{5}/_{32}$ in. Made to fill a rapidly growing need for a high quality A-C electrode for all-position use, the Airco No. 230 Electrode complies with all requirements of the American Welding Society Classification E6011, American Bureau of Shipping, Group H1G and B1G for A-C, and other specifications qualifying it for use on war work.

Physical test results made on all-weld-metal tensile specimens show ultimate tensile strength of 70,000–75,000 as welded, and 65,000–70,000 when stress relieved. Per cent elongation in 2 in. was 25–30 per cent as welded and 30–35 per cent when stress relieved. A characteristic of this A-C electrode is that average operators have no difficulty in securing good fusion and complete penetration. The finished weld deposit is quite smooth and has a uniform surface contour.

Decay of Wood Retarded

Decay, incessant enemy of wood, is retarded by the chemical urea used to reduce checks, cracks, and similar defects which may occur during the drying of green lumber, according to laboratory investigations reported by F. H. Kaufert and E. A. Behr of the University of Minnesota. Tests with Southern pine sapwood and Douglas fir, red oak, and cypress heartwood, showed that urea applied in the quantities approaching those used in the drying process prevented the growth of wood-rotting fungi.

Concentration of urea greater than 0.3%, based on the oven-dry weight of wood, reduced the rate of decay; concentrations greater than 1% prevented all growth of the wood-rotting fungi on the wood's surface.

For chemical seasoning approximately 40 to 100 lbs of urea per 1000 fbm is recommended, depending on the type and dimension of the wood. The chemical's effectiveness is based on the maintenance of a considerable concentration between the surface and the interior. Concentrations in the outer $^{1}/_{8}$ in. of the treated wood may be 10% and higher, based on the dry weight of the wood, while at $^{1}/_{2}$ in. from the surface they may be less than 0.3%. Definite preserving action would be exerted, the investigators feel, if these concentrations could be maintained under conditions conducive to decay.

Heating urea-treated wood causes some loss of urea. However, it appears to fix some of the chemical with the wood, either as urea or a reaction product, so that it is difficult to remove by leeching.

Urea, manufactured by the Ammonia Department of E. I. du Pont de Nemours & Company, has greatly facilitated the rapid seasoning of many lumber items urgently needed for war work. Used in air or kiln drying, it has made possible the seasoning of certain woods with minimum losses due to checks, cracks, and other drying defects.

GIVE THE ENGINE A BREAK!

WHATEVER type of "Caterpillar" Diesel equipment you operate, it's powered by a great engine. Thousands of veteran "Caterpillar" units are doing a heroic job these days — carrying on with sturdy efficiency long after their ordinary life span.

It's the *extra* qualities built into all "Caterpillar" Diesel Engines that are proving their worth today. They're simple, dependable, as nearly free from operating adjustments on the job as possible. But if you expect to get the utmost out of your engine, it's up to you to do *your* part.

First of all, read the instruction book and re-read it

Lubrication is important to engine life. Use the correct grade of oil, and change the oil and filters at proper intervals, as indicated by the hour-meter.

Keep the fan belt properly adjusted for cooling.

See that the cooling system is tight, and put in enough anti-freeze to give positive protection in winter weather.

Keep the air-cleaner clean, and remember it needs more attention if dust conditions are bad.

Keep the clutch properly adjusted to avoid slippage, and don't overload the machine oftener than is absolutely necessary.

When any repairs or special adjustments are needed, your "Caterpillar" dealer is ready day or night to help keep your engine working. He is equipped for every type of service.

He'll install new rings or recut piston ring grooves and put in wider rings if grooves are worn.

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CONCRETE PUMP—The 1942 models of Pumpcrete are described in Bulletin No. 404, which also contains data on how to apply, set up and operate a Pumpcrete system. Chain Belt Co., Milwaukee, Wis.

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TESTING EQUIPMENT—A booklet entitled "Automatic Stress-Strain Recording," has recently been published by The Baldwin Southwark Division of The Baldwin Locomotive Works, Philadelphia, Penna. One section is devoted to the interpretation of the stress-strain curve. Another section carries detailed descriptions of the recorders and accessory extensometers, with illustrations of a number of these items. Tables for guidance in making tests of bars, flats, sheets and wires are also set forth.

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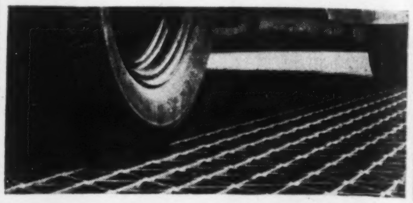

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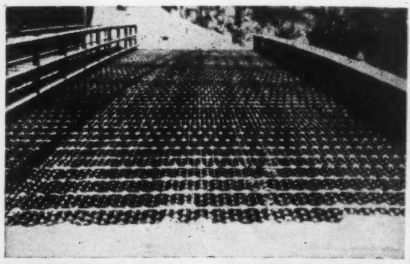

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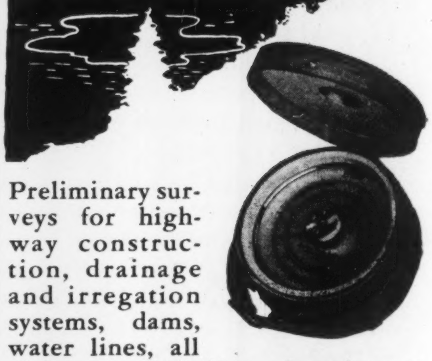

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DAMS

Concrete Arch, Mexico. La Planta de Construccion de la Presa de "La Angostura," Son, M. M. Ramos G. *Irrigacion en Mexico*, vol. 23, no. 3, May-June 1942, pp. 88–95. Construction plant of Angostura Dam in Sonora, Mexico; description of equipment used.

Design. Normas Generales Para el Diseno de Estructuras Empleadas en las Obras de Regadio, J. Gomez Garcia. *Irrigacion en Mexico*, vol. 23, no. 4, July-Aug. 1942, pp. 34–69. General standards for design of structures used in irrigation systems; common types of dams; standards for design of each, citing examples of structures now being built or already in service in different irrigation districts in Mexico; auxiliary structures are also considered. Bibliography.

Earth, Seepage. Filtraciones en la Cimentacion de la Cortina de la "Prese Requena," A. de La O. *Irrigacion en Mexico*, vol. 23, no. 3, May-June 1942, pp. 62–74, supp. plates. Seepages in foundation of core wall of "Requena" Dam; see description of design of this dam by C. H. Howell, indexed in *Engineering Index*, 1931, p. 369, from various sources, and commentary by Garcia Lascurain 1932, p. 330, from issue of Jan. 1932; present paper describes investigations and tests of permeability conditions in foundation.

Hydraulic Turbines. Grand Coulee Pits Adapted to Shasta Turbines. *Elec. World*, vol. 119, no. 8, Feb. 20, 1943, pp. 44–45. Additional power for war industries was recently provided by Bureau of Reclamation through installing temporarily at Grand Coulee Dam two 75,000-kw generating units built for use at Shasta Dam; counter-clockwise units were accommodated by puncturing walls of pits designed for clockwise wheels; new method of anchoring scroll cases against flotation described.

Hydraulic Turbines, Draft Tubes. Preliminary Design Chart—V: Dimensions of Draft Tubes, A. E. Niederhoff and F. L. B. Miller. *Western Construction News*, vol. 17, no. 12, Dec. 1942, pp. 541–543. Chart presents draft-tube dimensions for hydraulic turbines; features are discussed; value lies in making it possible for planning engineer working on preliminary proportions of structure to go ahead with his work without waiting for extensive hydraulic model tests; ore recommendations of specific turbine manufacturer.

Masonry, Failure. Historic Accidents and Disasters: Bouzey Dam. *Engineer*, vol. 174, no. 4,534, Dec. 4, 1942, pp. 452–455. Account of failure of masonry dam near Epinal, France, in 1895; analysis of factors involved leads to conclusion that Bouzey Dam failed because in it bad design was allied with inferior materials and defective workmanship.

Temporary. Temporary Dams, S. C. Bailey. *Dock & Harbour Authority*, vol. 23, nos. 265 and 266, Nov. 1942, pp. 162–165, and Dec., pp. 188–191. There are several types of dams in general use, and the particular type employed depends upon depth of water to be retained, nature of sea bed soil, speed at which work can be done, and possibility of obtaining suitable materials and cost; earth and mass concrete, steel, timber, puddle and box dams described; diagrams given.

FLOOD CONTROL

Forecasting. Flood Flow of Missouri Streams, H. W. Wood. Jr. *Missouri Univ., Eng. Experiment Station.-Bul. No. 30*, 1942, 86 pp. Review of most commonly accepted methods of estimating floods and study of existing data pertaining to Missouri streams, making use of theory of probability and of partial duration curve for analysis of stream-flow record. Bibliography.

FLOW OF FLUIDS

Soils, Mechanics. On Problem of Filtration in Anisotropic Soil, V. A. Braginskaya. *Prikladnaya Matematika i Mekhanika*, vol. 6, nos. 2–3, 1942, pp. 229–240. Case in which principal axes of filtration at every point, and coefficients of filtration along them are constant; ground is saturated with two fluids; lower is of greater density and is at rest, upper is in state of motion; motion is assumed to be steady; characteristic function of flow and configuration of demarcation line between fluids are investigated; problem is solved for cases of dam with sheet piling and floodbed. (In Russian with brief English abstract.)

FOUNDATIONS

Soil Surveys. Preliminary Surveys for Foundations, R. R. Minikin. *Civ. Eng.* (London), vol. 37, no. 438, Dec. 1942, pp. 255–258. Surveys should include data on limits of available area, contour lines of surface, nature of ground, nature of subsoil, and depth at which firm ground is encountered; methods of collecting and presenting such data are discussed.

Soils, Mechanics. Settlement of London Due to Underdrainage of London Clay, G. Wilson and H. Grace. *Instn. Civ. Engrs.—J.*, vol. 19, no. 2, Dec. 1942, pp. 100–127, supp. plates. Geology of London district; theory of consolidation of clay due to underdrainage; determination of theoretical settlements; comparison of actual and theoretical settlements in period, 1865–1931; future settlements.

Stresses. Influence Charts for Computation of Stresses in Elastic Foundations, N. M. Newmark. *Ill. Univ.—Eng. Experiment Station—Bul. No. 338*, Nov. 10, 1942, 28 pp. Bulletin describes simple graphical procedure for computing stresses in interior of elastic, homogeneous, isotropic solid, bounded by plane horizontal surface and loaded by distributed vertical loads, at surface; stresses are computed from charts given by counting number of elements of area, or blocks, covered by plan of loaded area drawn to proper scale and laid upon chart.

HYDROELECTRIC POWER PLANTS

Agriculture, Mexico. Potencialidad Agricola de la Region Costera de los Estados de Sonora y Sinaloa, A. Benassini. *Irrigacion en Mexico*, vol. 23, no. 5, Sept.-Oct. 1942, pp. 89–103. Agricultural possibilities of coastal region of states of Sonora and Sinaloa; general considerations; general description of region; present agricultural use of land; crops and markets; communications; possibilities of irrigation; water storage reservoirs for flood control and for hydroelectric power development; works now under construction; future projects.

INLAND WATERWAYS

Rivers, Improvement. Schemes of Improvement for River Parrett. Investigation with Aid of Tidal Model, J. Allen. *Instn. Civ. Engrs.—J.*, vol. 19, no. 2, Dec. 1942, pp. 85–99. Schemes of improvement for river Parrett and results of extensive tidal model investigations.

IRRIGATION

India. Triennial Review of Irrigation in India, 1936–1939. *India Dept. Labor—Publ. 1942*, 61 pp., price 4*s*. Results of irrigation operations during period 1936–1939; progress of irrigation in various provinces; statements showing financial results of productive and non-productive irrigation, navigation, embankment, and drainage works in India.

Mexico. Apsecto Tecnico de la Irrigacion, A. Orive Alba. *Irrigacion en Mexico*, vol. 23, no. 4, July-Aug. 1942, pp. 5–17. Technical aspect of irrigation; value of annual agricultural production in Mexico and harvested area in hectares; climatic data, as related to agricultural possibilities; tropical coasts, northern region, and central plateau; how irrigation may remedy deficiencies in agricultural production; five systems of irrigation discussed; historical résumé of development of irrigation in Mexio; incidental development of hydroelectric power; future possibilities.

LAND RECLAMATION AND DRAINAGE

Airports. Airport Drainage on Rocky Site. *Eng. News-Rec.*, vol. 130, no. 2, Jan. 14, 1943, pp. 28–30. Because many trenches for pipe had to be blasted through rock, construction of drainage system was one of major problems in building airbase; for this phase of work nearly 50,000 cu yd of rock were removed with average dynamite consumption about 3 lb per cu yd; over 40,000 lin ft of concrete pipe varying in size from 12 to 108 in. and 33,400 lin ft of vitrified clay pipe 6 in. in diameter were installed.

Culverts. Utilization of Siphon Principles in California Culvert Practice, G. A. Tilton, Jr., and R. R. Rowe. *Calif. Highways & Pub. Works*, vol. 21, no. 2, Feb. 1943, pp. 4–7 and 20. Purpose of article is to foster and encourage development and design of siphon culverts and point out practical advantages and adaptations; subject is treated in detail: definitions, theory, design, and application. Bibliography.

Culverts, Concrete. Precast Concrete Culvert Solved Troublesome Channel Problem. *Ry. Age*, vol. 114, no. 5, Jan. 30, 1943, pp. 282–284. Manner in which Bessemer & Lake Erie Railroad overcame difficulties encountered in replacing light wood trestle over stream having quick runoff described.

Culverts, Design. Culvert Outlets and Endwalls on California Highway System, R. R. Rowe and C. F. Woodin. *Calif. Highways & Pub. Works*, vol. 21, no. 1, Jan. 1943, pp. 6–11. Study of factors influencing designs of outlet works; for reasons given, factors at any one site are variable with time and beyond control by designer; type of works must be selected by judgment rather than rule; maintenance should modify works rather than restore initial conditions.

United States. Reclamation Handbook. *U.S. Bur. Reclamation—Conservation Bul. No. 2*, 1942, 99 pp., supp. plates 20 cents. Information on reasons for and development, operations, and results of conserving water and reclaiming land in western United States.

MATERIALS TESTING

Concrete. Some Factors Influencing Strength of Concrete Containing Admixtures of Powdered Aluminum, C. A. Menzel. *Am. Concrete Inst.—J.*, vol. 14, no. 3, Jan. 1943, pp. 165–184. Discussion and results of tests give general idea of various factors influencing compressive strength of concrete containing aluminum powder; these tests demonstrated repeatedly that compressive strength of plastic concrete made into standard 6- by 12-in. cylinders was reduced progressively with added increments of aluminum powder so long as no restraint to expansion was imposed at toe of cylinder.

Embankments, Stability. Pore Pressures in Earthen Embankments, M. G. Speedie. *Commonwealth Engr.*, vol. 30, no. 5, Dec. 1, 1942, pp. 103–105. Important advance in science of earth dams is that associated with measurement of internal hydrostatic pressure of fluid in voids of soil mass; these pressures have profound effect on stability of such structures; description of two methods tried in Victoria, Australia, for measuring hydrostatic head in earth dams or embankments.

Road Materials, Bituminous. Sulfonation Index Test for Road Tars, R. H. Lewis and W. J. Halstead. *Pub. Roads*, vol. 23, no. 7, Jan.-Mar. 1943, pp. 141–154 and 164–165. Types of hydrocarbons present in asphaltic and tar products; modification in test method for determining sulfonation index suggested that will insure more accurate results; study of relationship between sulfonation indexes and weathering properties of tars was made by exposing $^{1}/_{8}$-in. films of tar and compressed sand tar mixtures to accelerated weathering conditions of weatherometer; results.

Welds Stresses. Behavior of Spot Welds Under Fatigue Stress, A. M. Unger, H. A. Matis, and E. P. Gruca. *Welding J.*, vol. 22, no. 3, Mar. 1943, pp. 135-s–142-s. Illustrated description of simple fatigue test which can be undertaken at minimum of time and expense; spot welds are subject to stresses in two main directions; one is stress that is along axis of pieces welded together tending to shear weld, other is stress caused by tendency to bend sheet or "peel" spot weld; paper is mainly concerned with peeling type of stress.

PORTS AND MARITIME STRUCTURES

Port Structures, Protection. Protection Problems for Dock Buildings, E. Hardy. *Dock & Harbour Authority*, vol. 23, no. 266, Dec. 1942, pp. 195–196. In repair and rebuilding of raid-damaged dock and areas, much can be done to lessen problems of vermin, dry rot, fire, and other troubles, if attention is paid to proofing new buildings as far as is possible against these troubles; procedure outlined.

ROADS AND STREETS

Access. How Nation's War Needs Are Served by Constructing Access Roads, R. E. Royall. *Construction Methods*, vol. 25, no. 1, Jan. 1943, pp. 42–45, 76, 78, and 80. Illustrations and descriptive notes on materials and equipment used in building access roads to hundreds of war industries and military and naval establishments.

Accident Prevention. Safety Practices on Highway Jobs, J. C. Martin. *Eng. & Contract. Rec.*, vol. 56, no. 8, Feb. 24, 1943, pp. 68–69 and 77. Accident rate of public utilities' and contractors' employees engaged on highway repair and maintenance work is far too high; careful observance of rules outlined will reduce number of accidents and cut workmen's compensation costs. From pamphlet on subject issued by Nat. Safety Council.

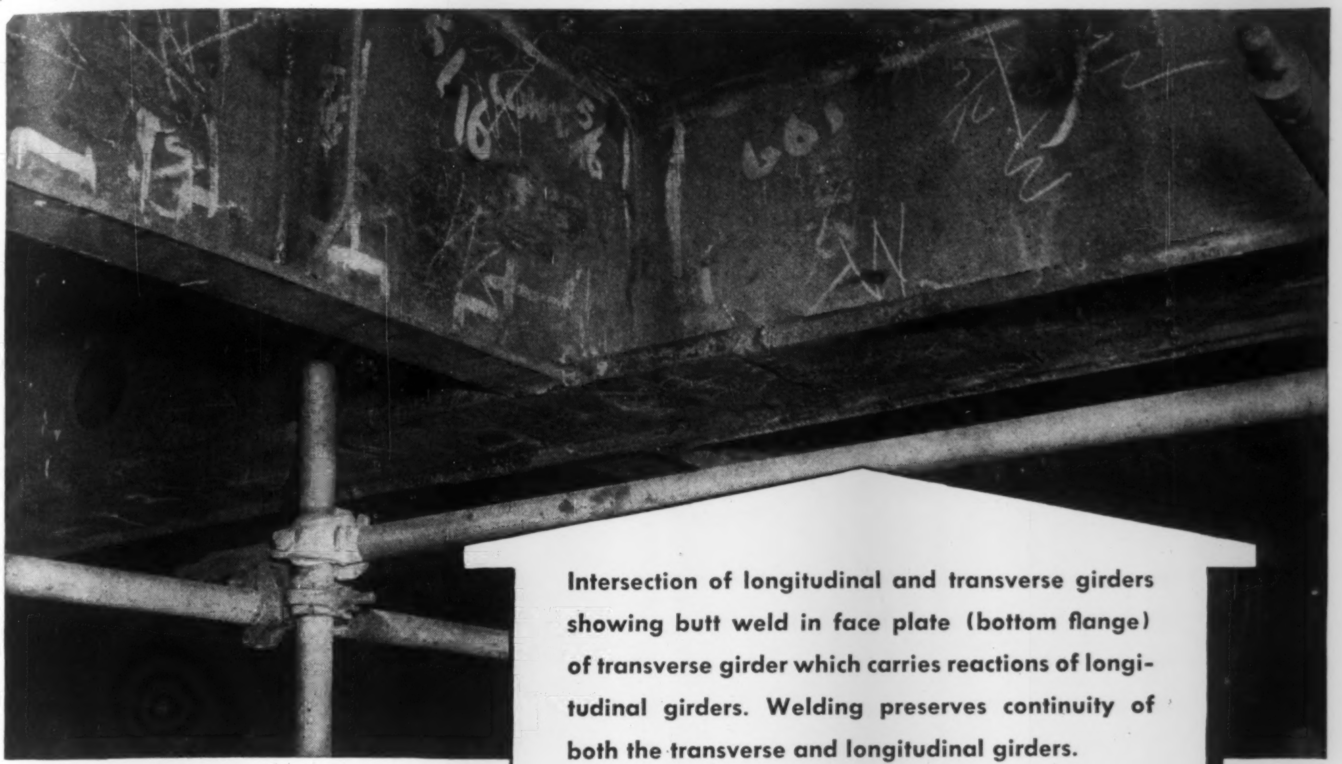
Airport Runways, Soil Cement. 126-Acre Soil-Cement Landing Mat for Navy Planes. *Roads & Streets*, vol. 86, no. 2, Feb. 1943, pp. 35–39. Permanent landing mat for training planes in midwest is 2,500 ft square, having two concrete runways extending into it; mat construction plan; soils and drainage methods; grading and preliminary; soil cement processing; dry mixing; water spreading and moist mixing; compacting; surface finishing; protection and cover, etc.

Airport Runways, Soil Cement. Soil-Cement Pavement for Desert Airbase. *Eng. News-Rec.*, vol. 129, no. 27, Dec. 31, 1942, pp. 921–925. Step-by-step methods of soil-cement paving and laboratory and inspection control followed in building desert Army airbase; total of 750,000 sq yd of paving was laid in 49 days with 35,011 sq yd built in one 18-hour period; machinery employed was secured from many sources and included pulverizers and other agricultural tools, and cement trucks from oil-well industry; little special equipment was used.

Construction. New Express Highway Eliminates War Traffic Bottleneck, W. C. Murray. *Highway Mag.*, vol. 34, Jan.-Feb. 1943, pp. 4–8. Details of two projects in west central Connecticut, which involve retaining wall and advance erosion control construction; construction views of slope-erosion protection are shown.

Construction. Orange County Highway Is Realigned, A. N. George. *Calif. Highways & Pub. Works*, vol. 21, no. 1, Jan. 1943, pp. 16–17. Route 171 in Orange County makes straight north-and-south connection between Route 174 and Route 60; alinement of route marred by right-angle job at Lincoln Avenue; improvement consisted of divided highway providing two roadways each with 23 ft of surfacing, separated by 30 ft of graded unsurfaced area; bituminous surface treated shoulders were provided on each strip; new highway was raised above existing ground by means of imported borrow.

Drainage. Da Construcao de Boeiros, A. C. Ribeiro, Sao Paulo, Brazil. *Departamento de Estradas de Rodagem—Boletim*, vol. 8, no. 27, Apr. 1942, pp. 147–157. Construction of drainage



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culverts; description of methods adopted on Via Anchieta automobile highway, for stabilization of heavy unconsolidated fills. See paper by same author, indexed in *Engineering Index*, 1940, p. 1043, from issue of Oct. 1940.

FLIGHT STRIPS. Highway Engineers and Contractors Build West-Coast Flight Strip, T. H. Dennis. *Construction Methods*, vol. 25, no. 1, Jan. 1943, pp. 50–51 and 130. Illustrated description and construction details of flight strip built for use of Army Air Forces; strip provides graded area of about 100 acres marked by asphalt-paved runway 150 ft wide and 4,000 ft long.

FLIGHT STRIPS. How Flight Strips Are Being Built. *Eng. News-Rec.*, vol. 130, no. 4, Jan. 28, 1943, pp. 128–132. Rapid progress is being made in completing $10,000,000 flight strip program that Congress authorized a year ago; most of strips are in seaboard states and all are located in accordance with military requirements; stabilized local materials are used for subbases, and most surfaces are of bituminous type although concrete is also used.

HIGHWAY ENGINEERING. Highway Transportation in War Time, C. P. Gross. *Am. Highways*, vol. 22, no. 1, Jan. 1943, pp. 19–20 and 27. Significance of highways today; objectives of Transportation Corps; highway division of Corps; dependence of nation on highway; access roads construction; strategic network; improving strategic highways; Alaska road; inter-American highway; flight strips; maintaining highway system during wartime; confidence in highway engineer.

HIGHWAY ENGINEERING, POST-WAR. City's Place in Post-War Highway Planning, T. H. MacDonald. *Am. City*, vol. 58, no. 2, Feb. 1943, pp. 42–44. Concrete advice on what cities should do to help provide economic "backlog" against post-war recession; service for urban and metropolitan areas; how cities can cooperate; federal participation; important city projects; inter-regional highways; belt-line roads.

HIGHWAY ENGINEERING, POST-WAR. Post-War Construction. *Roads & Streets*, vol. 86, no. 2, Feb. 1943, pp. 58, 60, 62, 64, and 70–72. Statements from State Highway Officials regarding their plans for highway work after war is over.

HIGHWAY ENGINEERING, POST-WAR. Thoughts on Road Problem, A. N. Dryland. *Surveyor*, vol. 102, no. 2659, Jan. 8, 1943, p. 18; see also *Eng. & Contract. Rec.*, vol. 56, no. 5, Feb. 3, 1943, pp. 11 and 20. Some provocative and stimulating comments on factors affecting post-war highway planning.

HIGHWAY ENGINEERING, UNITED STATES. Highway Operations Under War Conditions. *Eng. News-Rec.*, vol. 130, no. 2, Jan. 14, 1943, pp. 43–62. Special section containing discussion of problems brought to state highway departments by war restrictions under which they must operate includes following articles: National Highway Situation, T. H. MacDonald; Road Plans and Expenditures; Keeping Road Equipment in Service, F. Kelso; Michigan Builds War Roads; Maintenance During War, R. M. Whitton; Keeping Trucks Rolling in Oregon, E. A. Collier; Virginia Roads on War Basis, J. J. Forrer.

HIGHWAY ENGINEERING, WARTIME. Roads Under War Restrictions—V. *Eng. News-Rec.*, vol. 130, no. 10, Mar. 11, 1943, pp. 351–356. Review of problems that war restrictions have placed on highway engineers; conditions reported in brief articles as follows: Virginia Cuts Work Fifty Per Cent; Indiana Builds Access Roads; Georgia Short on Manpower; Debts Trouble West Virginia; Kentucky Has Maintenance Labor.

HIGHWAY SYSTEMS. Willow Run Access Highway System, G. D. Kennedy. *Highway Mag.*, vol. 34, Jan.-Feb. 1943, pp. 15–19. Notes on construction of highway system to Willow Run bomber plant; winter construction; no load restrictions; steel saved in bridges; pavement construction.

HIGHWAY SYSTEMS, ALASKA. Alcan Highway Aggregates, H. J. McKeever. *Rock Products*, vol. 46, no. 1, Jan. 1943, pp. 55–58 and 127. Canada-Alaska or "Alcan" Military Highway is gravel and stone road; small portion is completed to highest standards of gravel roadway design; surfacing and aggregate materials; no crushing plants used in northern sector during 1942; in southern sector, aggregate plants figured importantly in work of two of largest management contractors.

HIGHWAY SYSTEMS, ALASKA. Alcan Highway, H. J. McKeever. *Roads & Streets*, vol. 86, nos. 1, and 2, Jan. 1943, pp. 34–60, 70, and 72, and Feb., pp. 40–52. Article covers all phases of construction and problems which complicated completion and maintenance; highway built in 1 year; roadway specifications; clearing and grading; maintenance and winter problems; note on builders; historical notes; equipment repairs and maintenance; culverts and bridges; reconnaissance and surveys.

HIGHWAY SYSTEMS, ALASKA-CANADA. Alcan—America's Glory Road, H. W. Richardson. *Eng. News-Rec.*, vol. 129, no. 27, Dec. 31, 1942, pp. 907–914. Problems of supply and subsistence, camps, and headquarters facilities, and conditions under which soldiers, engineers, and contractors lived, worked, and moved.

HIGHWAY SYSTEMS, ALASKA-CANADA. U.S. Army's First Official Story of Alaska Highway, C. L. Sturdevant. *Roads & Bridges*, vol. 81, no. 3, Mar. 1943, pp. 27–32, 62, 64, 66, and 68; see also *Eng. & Contract Rec.*, vol. 56, no. 8, Feb. 24, 1943, pp. 48–51 and 78–79. History, organization, and progress of military road to Alaska. Before Eng. Inst. Canada.

HIGHWAY SYSTEMS, PAN-AMERICAN. Pan-American Highway, E. W. James. *Explosives Engr.*, vol. 20, no. 12, Dec. 1942, pp. 358–364. Compare similar paper by same author, previously indexed from *Eng. & Contract Rec.*, Jan. 13, 1943.

HIGHWAY SYSTEMS, RELOCATION. Relocation of U.S. 99, Around Shasta Dam Reservoir Site Completed and Opened to Public Traffic, E. J. Bassett. *Calif. Highways & Pub. Works*, vol. 21, no. 2, Feb. 1943, pp. 1–3 and 8. Technical details pertaining to Pit River Bridge and relocation of U.S. Highway 99.

INTERSECTIONS. California Project Involves Novel Intersectional Design, A. G. Lindley. *Pub. Works*, vol. 74, no. 2, Feb. 1943, pp. 13 and 39–40. How heavy intersectional traffic is handled on East Shore Highway, by use of channelization structures combined with system of traffic-actuated signals.

LOW-COST. Stabilized Crushed-Rock Surfaces, J. E. Herzog. *Better Roads*, vol. 13, no. 2, Feb. 1943, pp. 21–22. Low-cost processing of highways in Steele County, Minnesota, saves surfacing materials and produces smooth, hard, and dust-free roads.

MAINTENANCE AND REPAIR. Illinois Rehabilitates for War. *Better Roads*, vol. 13, no. 1, Jan. 1943, pp. 21–24. Details of program of concrete patching and bituminous resurfacing carried out by Illinois Division of Highways; keeps highways open after damage by wartime overloads.

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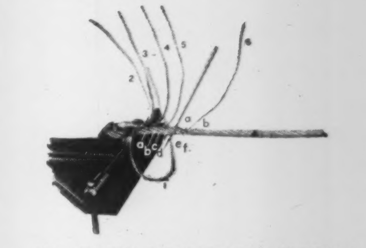

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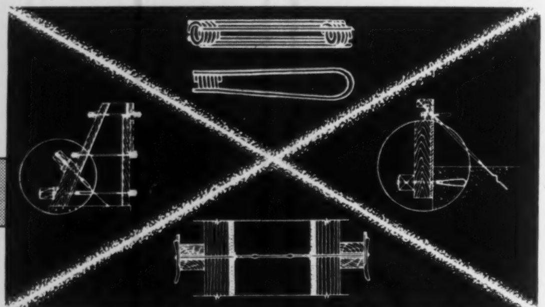

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MAINTENANCE AND REPAIR. Importance of Adequately Maintained Roads in Wartime, J. G. Cameron. *Roads & Bridges*, vol. 81, no. 3, Mar. 1943, pp. 74 and 76. Subject analyzed briefly with view to determining why and to what extent roads should be maintained during present crisis. Before Ontario Good Roads Assn.

MAINTENANCE AND REPAIR. Repairing Pavement Breaks with Calcium Chloride Stabilized Patching Mix, R. H. Reid. *Eng. & Contract. Rec.*, vol. 56, no. 10, Mar. 10, 1943, pp. 21–23. Method of making calcium chloride mulch for patching; equipment required; reasons for patching are set forth.

MAINTENANCE AND REPAIR. Technique for Rapid Repair of Airport Runways and Military Roads, I. G. Mayer. *Eng. & Contract. Rec.*, vol. 56, no. 8, Feb. 24, 1943, pp. 56–57. Idea as presented is intended as survey of present possibilities of method as medium for further research; mat should be designed to provide densest pavement possible as long as sufficient emulsified asphalt is used to provide necessary flexibility. Prize paper submitted in contest sponsored by "Compressed Air Inst."

MAINTENANCE AND REPAIR, SASKATCHEWAN. Highway Maintenance Plans for 1943 in Saskatchewan, H. R. Mackenzie. *Eng. & Contract. Rec.*, vol. 56, no. 8, Feb. 24, 1943, pp. 52–53. Maintenance program of Department of Highways and Transportation involving repair and replacement of bridges and provincial highways; statistical data given.

POST-WAR. Municipal Road Financing for Post-War Period, J. N. Allen. *Eng. & Contract. Rec.*, vol. 56, no. 10, Mar. 10, 1943, pp. 17–19 and 23. Author's recollections with reference to development of Canadian road system; practical plan, presented for present financing of post-war projects. Before Ontario Good Roads Assn.

ROAD MATERIALS. Developments in Highway Materials, W. W. McLaughlin. *Eng. & Contract. Rec.*, vol. 56, no. 8, Feb. 24, 1943, pp. 57–58. Wartime restrictions and scarcities are forcing highway maintenance engineers to seek new materials to keep necessary work going; some of new trends are outlined. Before 28th Annual Highway Conference of Univ. of Mich.

ROAD MATERIALS, ASPHALT. Asphalt from Alberta Tar Sands, J. H. Holloway. *Roads & Bridges*, vol. 81, no. 3, Mar. 1943, pp. 78, 80, 82, 84, and 86. New interest attaches to vast bituminous sand deposits of northern Alberta because of asphalt requirements of Alaska and other military highways and of new airports in Canadian Northwest; information concerning deposits and their possible use as source of paving asphalt. From *Can. Surveyor*, date not specified.

STABILIZATION. Design and Testing Soil-Cement Mixtures, A. H. Gawith. *Commonwealth Engr.*, vol. 30, no. 4, Nov. 2, 1942, pp. 79–82. There are two distinct methods of approach to problem of cement treatment of soils, depending on degree of hardening desired; cement modified soils; soil cement; cement required; optimum moisture content; determination of cement content; pulverization required; delayed compaction test; durability test; cost of soil cement; effect of sand; summary of test results.

SEWERAGE AND SEWAGE DISPOSAL

CAMPS, MILITARY. Operation of Army Sewage Treatment Plants, L. H. Kessler and J. T. Norgaard. *Sewage Works J.*, vol. 14, no. 6, Nov. 1942, pp. 1228–1261, (discussion) 1261–1263. Survey of army treatment plants and operating experiences; design factors and units; operating personnel; discussion of filters, sludge digestions, activated sludge, Hays aeration process, and biofilters; data on operating results presented

DISPOSAL PLANTS, CAIRO, EGYPT. Increased Sedimentation Tank Efficiency, M. Raef. *Eng. & Contract Rec.*, vol. 56, no. 4, Jan. 27, 1943, pp. 18–19. Wooden baffle walls constructed at inlets of Travis hydrolytic tanks used in sewage plant at Cairo, Egypt.

DISPOSAL PLANTS, CALCUTTA. Sewage Clarification Plant for Calcutta, P. C. Bose. *Assn. Engrs.—J.*, vol. 18, no. 1, Mar. 1942, pp. 3–12. Discharge of storm water and sewage in Calcutta accomplished by two different channels; presettlement of sewage prior to discharge into carrier channel required sedimentation tanks; description of tanks and pump house.

EFFECT OF WAR. Influence of This War Upon Sewage Problems, A. M. Rawn. *Sewage Works J.*, vol. 14, no. 6, Nov. 1942, pp. 1217–1225, (discussion) 1225–1227. Materials, equipment, man-power, migration of population, and sewage characteristics have had detrimental effects on sewage plant efficiencies since 1940; discussion points out, however, that army-camp disposal facilities have maintained high standards of efficiency, also that government grants have enabled plants to expand in critical areas.

GREAT BRITAIN. Purification of Settled Sewage in Percolating Filters in Series, with Periodic Change in Order of Filters, J. M. Wishart and R. Wilkinson. *Inst. Sewage Purification—J. & Proc.*, 1941 pp. 15–38, supp plates. Results of operation of experimental plant at Minworth, Birmingham, 1938 to 1940; experiments described prove that capacity of two filters operated as single filters in parallel can be doubled by operating them in accordance with new method of "alternating double filtration."

GREAT BRITAIN. Yardley Sewage-Disposal Works of Birmingham, Tame and Rea District Drainage Board, F. C. Vokes and S. H. Jenkins *Instn. Civ. Engrs.—J.*, vol. 19, no. 2, Dec. 1942, pp. 65–84. Conditions at Yardley works up to 1936; effect on bacteria beds of acid trade wastes in 1936; temporary treatment of trade wastes in 1937; results obtained in enlarged works; partial treatment of tank effluent by bio-flocculation; condition of bacteria beds before and after enlargement of works; effect of applying untreated sedimentation tank effluent and bio-flocculation plant effluent to beds at high rates of flow.

INDUSTRIAL WASTE. Acid Waste Treatment with Lime, W. Rudolfs. *Indus. & Eng. Chem.*, vol. 35, no. 2, Feb. 1943, pp. 227–230. Paper primarily confined to discussion of characteristics of wastes, their variations in strength and fluctuations in flow, and presentation of laboratory results pertaining to treatment of wastes to prevent difficulties. Before Am. Chem. Soc.

MODERN DISPOSAL PLANTS. Modern Sewage Plant for Small Town, J. J. Corbalis, Jr. *Am. City*, vol. 58, no. 2, Feb. 1943, pp. 40–41. Description of sewage-treatment plant for town of Herndon, Va., with population of 1,000; financing of project; extensions; operating problems; results; plant's future.

SEWERS, DESIGN. Minimum Velocities for Sewers. *Boston Soc. Civ. Engrs.—J.*, vol. 29, no. 4, Oct. 1942, pp. 286–363. Final report of Committee of Boston Soc. Civ. Engrs., to study limiting velocities of flow in sewers.

SEWERS, STORM. Storm Water Overflows, R. B. Stegmaier, Jr. *Sewage Works J.*, vol. 14, no. 6, Nov. 1942, pp. 1264–1273. Article is brief presentation and analysis of data obtained at discharge end of combined sewer; its purpose is to aid in solution of problem of how much storm runoff should be discharged directly into nearest water-course; conclusion is that amounts of all types of solids discharged are proportional to discharge. Bibliography.

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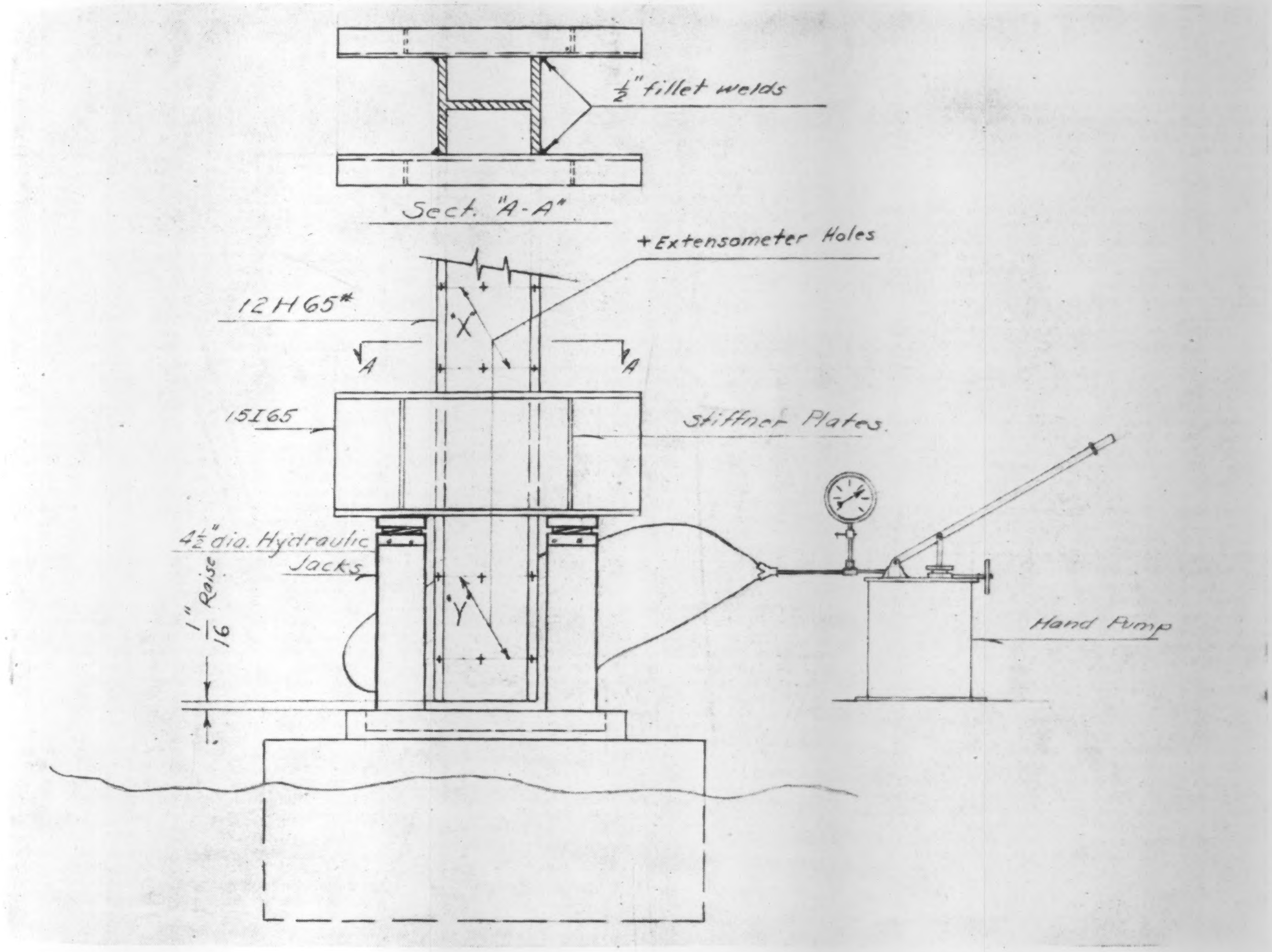
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Sludge. Anaerobic Digestion I: Correction of Errors During Measurement and Analysis of Gas, J. R. Snell. *Sewage Work J.*, vol. 14, no. 6, Nov. 1942, pp. 1304–1313. During studies on anaerobic digestion of human excreta ordinary technique for measuring and analyzing evolved gases was improved; new correction scale is described, to be used during reading of volumes of gases produced; errors in measurement of evolved gases are outlined, and corrections are provided for them.

STRUCTURAL ENGINEERING

Beams and Girders. Beams of Variable Moment of Inertia, J. B. Wilbur. *Boston Soc. Civ. Engrs.—J.*, vol. 29, no. 4, Oct. 1942, pp. 264–285. Procedures are suggested for simplified method based on tabular values and equations for determination of fixed end moments, sidesway moments, stiffnesses, and carry-over factors for use in moment-distribution solution of rigid frames.

Beams and Girders, Stresses. Free and Forced Oscillations of Continuous Beams: Treatment by Admittance Method, W. J. Duncan. London, Edinburgh & Dublin *Philosophical Mag. & J. Science*, vol. 34, no. 228, Jan. 1943, pp. 49–63. Admittance method is readily applicable to problem of determining steady oscillation of continuous beam of most general kind due to impressed normal simple harmonic forces, with end thrust or tension present or absent; general form of theorem of three moments for static loads; forced and free oscillations of continuous beam and calculation of natural frequencies; treatment of beams with built-in ends. Bibliography.

Columns, Design. Beam-Method of Design for Eccentrically Loaded Columns, O. Albert. *Eng. News-Rec.*, vol. 130, no. 10, Mar. 11, 1943, pp. 365–367. Direct method of design for eccentrically loaded columns, by transposing column section into comparable beam section and solving as for a beam; essential steps are to move eccentric load onto tension steel, add enough steel area to take care of it, and to replace effect of eccentricity by a moment; then if column section is rotated 90 deg it becomes a beam, and can be solved as such.

Framed Structures. Study in Modern Methods of Rigid Frame Analysis, G. A. Maney. *Western Soc. Engrs.—J.*, vol. 47, no. 6, Dec. 1942, pp. 259–273. Importance of convergence in modern methods of rigid-frame analysis; discussion of multiple-joint rigid-frame problem in buildings where sidesway due to unsymmetrical live loading may be ignored and solved by fixed-end method or by moment distribution; slope-deflection method illustrated.

Roof Trusses, Design. Combine Steel and Timber in Factory Trusses. *Eng. & Contract Rec.*, vol. 56, no. 6, Feb. 10, 1943, pp. 10–11. Unusual design of 99-ft span, saw-tooth timber trusses, with steel diagonals, adopted in large aircraft factory recently completed in eastern Canada, to ensure maximum penetration of natural light.

Stresses. Stress Concentration Factors and Their Effect on Design, G. H. Neugebauer. *Product Eng.*, vol. 14, no. 2, Feb. 1943, pp. 82–87. Stress concentration factors that are most useful and dependable in computation of design stresses at weak points in many forms of design have been selected and correlated from work of many investigators; tabulation includes only directly applicable factors and omits data having doubtful bases or extremely limited application in engineering design.

Wooden Construction. Some Fundamentals of Timber Design, H. J. Hansen. *Tex. Agric. & Mech. College—Eng. Experiment Station—Bul. No. 66*, May 1, 1942, 76 pp. Bulletin presents procedures and factors governing use of fundamental formulas necessary to engineer in designing timber structures; this is first of series of bulletins on wood and plywood; characteristics influencing design; use of working stresses; control of effects of shrinkage; fastenings; beams; columns; members with combined bending and axial loads; glued laminated construction.

SURVEYING

Roads and Streets. Three-Stage Surveying Procedure for Post-War Road Projects, W. J. Fulton. *Roads & Bridges*, vol. 81, no. 3, Mar. 1943, pp. 42–43 and 68. How Ontario Dept. of Highways is approaching problem of constructing sometime in future divided highway across southern part of Ontario from Windsor to Quebec boundary; aerial photography simplifies task of planning large-scale undertakings. Before Assn. Ontario Land Surveyors.

Town Planning. Surveyor's Part in Town Planning, H. G. Foxall. *Australian Surveyor*, vol. 9, no. 3, Sept. 1, 1942, pp. 102–106. Review of surveyor's work includes study of weather and prevailing winds, water supply, topographical and soil surveys, road and railway access to and from town, sewage plants and recommendation of sites, and storm-water drainage. Before Instn. Surveyors, NSW.

TRAFFIC CONTROL

Parking. Parking Problem as Factor in Roadway Design. *Roads & Bridges*, vol. 81, no. 2, Feb. 1943, pp. 28–30, 54, 56, and 58. Summary of extensive study carried out by Eno Foundation for Highway Traffic Control.

TUNNELS

Air-Raid Precautions, Shelters. Deep Tunnel Air Raid Shelters. *Engineer*, vol. 174, nos. 4,534 and 4,535, Dec. 4, 1942, pp. 456–468, and Dec. 11, pp. 472–474. Further details given as to arrangement of these shelters and methods by which they were constructed. (Concluded.)

Vehicular, New York City. Traffic Goes Under, O. Singstad. *Tech. Eng. News*, vol. 23, no. 5, Oct. 1942, pp. 104–107, 116, 118, 120, and 122. Details of administration, financing, and preliminary considerations in construction of Queens-Midtown and Brooklyn Battery tunnels; tunneling and related operations on Queens-Midtown Tunnel are discussed and specific information given on materials and equipment used; due to inability to secure necessary material, work on Brooklyn-Battery Tunnel has been suspended.

WATER PIPE LINES

Cleaning. Proposed Plan for Water Main Sterilization, A. N. Heller. *Am. Water Works Assn.—J.*, vol. 35, no. 2, Feb. 1943, pp. 168–172. Procedure employed in sterilizing 11 miles of new freshwater mains in New York Navy Yard; procedure involved repeated introduction of relatively low chlorine dosages for periods of 24 hours; in actual practice, technique involved maintenance of "free" chlorine residual, determined by orthotolidine flash reaction, of 0.5 to 2.0 ppm beyond "breakpoint" during 24-hour period of treatment. Bibliography.

Cross-Connections. Cross-Connection Survey in Calhoun County, Michigan, E. L. Stockton. *Missouri Univ.—Eng. Experiment Station—Bul. No. 31*, 1942, 122 pp. Survey conducted to locate such cross connections as existed in typical county and to determine extent to which they constitute potential health hazards; defective plumbing and its relation to disease; list of plumbing defects and their locations; procedure recommended for elimination of dangerous connections found.

WATER TREATMENT

Filtration Plants, Longueuil, Quebec. New Filtration Plant at Longueuil. *Eng. & Contract. Rec.*, vol. 56, no. 7, Feb. 17, 1943, pp. 10–12 and 23. Quebec municipality builds new 4,000,000 gal per day filtration plant and 27-in. concrete intake from St. Lawrence River to supply heavy demands of war industries and military establishments; constructional details.

Industrial Plants. Water Treatment for Industrial Plants, D. R. Hiskey. *Pacific Coast Gas Assn.—Proc.*, vol. 33, 1942, pp. 67–70. Various sources of supply of water for industrial application are available from rivers, lakes, wells, and springs; all contain dissolved minerals, which may be source of trouble; water difficulties, their causes, effect, and control are discussed; cooling systems; zeolite system of softening; addition of chemical to cooling system; boiler corrosion and pitting; priming and foaming; treatment and control.

Plants, Portsmouth, Va. Ingenuity in Modern Water-Works Design Overcomes Critical Materials Shortage at Portsmouth, Va., P. E. Langdon. *Am. City*, vol. 58, no. 3, Mar. 1943, pp. 60–61. Description of new water-treatment plant of Portsmouth, Va.; when job is completed, it will show reduction of 85% in use of steel, 40% in cast iron, and similar large percentages in copper, bronze, brass, and related vitally needed material; mass concrete will constitute generous portion of reservoirs and settling basins; operating procedure.

Review of Modern Practice. Review of Modern Water Purification, G. B. Barham. *Eng. & Contract. Rec.*, vol. 56, no. 4, Jan. 27, 1943, pp. 12–13. What is meant by pure water; various methods of water purification considered.

Standards. Manual of Recommended Water Sanitation Practice Accompanying United States Public Health Service Drinking Water Standards, 1942. *Am. Water Works Assn.—J.*, vol. 35, no. 2, Feb. 1943, pp. 135–158. Statement of standards and recommended manual of water works practice; scope of requisite information as to source and protection; recommended sanitary requirements for water treatment systems, and water distribution systems; discussion of chemical requirements for revised drinking water standards; bacteriological requirements. Bibliography.

Taste and Odor Control. Tastes and Odors in Water—Causes and Prevention, F. O. A. Almquist. *Conn. Soc. Civ. Engrs.—Annual Report 1942*, pp. 19–40, (discussion) 40–43. Indication and discussion of tastes and odors which may be found in water; methods of measuring them, together with discussion of causes and prevention.

Water Pollution. Polio Virus and Water Purification, H. J. Carlson, G. M. Ridenour, and C. F. McKhann. *Eng. News-Rec.*, vol. 129, no. 27, Dec. 31, 1942, pp. 933–934. Presence of poliomyelitis virus in sewage-polluted waters raises questions concerning efficacy of water purification in removal of virus; preliminary studies at Univ. of Michigan indicate that no individual unit of purification process will remove virus completely, but that each has some effect; initial concentration plays role on amount of virus remaining in water after treatment. Bibliography.

WATER WORKS ENGINEERING

Air-Raid Precautions, Water Supply. Civilian Defense and Public Water Supply, G. E. McCallum. *Am. Water Works Assn.—J.*, vol. 35, no. 1, Jan. 1943, pp. 27–29. Problems and recommended practices in maintaining adequate public water supply; recommended organization for emergency, stressing that vital spots in water-works system should be covered.

Air-Raid Precautions, Water Supply. Maintenance of Public Water Supplies for Civilian Defense, D. W. Evans. *Am. Water Works Assn.—J.*, vol. 35, no. 1, Jan. 1943, pp. 30–33. Auxiliary pumping units, sources of supply, and emergency tank services should be developed, even though they may never be used; maintenance crews for shut-off and chlorination services should be expanded as much as possible; safe water should be maintained at all times and all points on distribution system.

Argentina. Obras de Provision de Aqua Potable La Ciudad de Villa Dolores (Provincia de Cordoba), L. A. Duprat. *Boletin de Obras Sanitariae de la Nacion*, vol. 6, no. 64, Oct. 1942, pp. 264–271. Water works of city of Villa Dolores, Province of Cordoba, Argentina; population increased from 5,825 in 1941 to 17,674 in 1942; primitive water supply; 6500-m aqueduct from filtering plant at intake on Sauces River; chlorination plant; 18,000-m distribution system.

Ducts. Big Concrete Pipe Ducts Speed War Project. *Eng. News-Rec.*, vol. 129, no. 27, Dec. 31, 1942, pp. 926–927. Use of reinforced-concrete pipe as underground conduits for heating system of new plant for General Electric Co.; in addition to heat and electric power, at least 12 other services had to be provided, and quick and satisfactory installation of these was possible by placing necessary piping in roof framing.

Management. War Emphasis in Water Works Management, S. B. Morris. *Am. Water Works Assn.—J.*, vol. 35, no. 1, Jan. 1943, pp. 1–6. Financial considerations and present problems which must be faced in administration of adequate water supply; post-war water works planning discussed; placement of men released from war duties considered; stress on intelligent selection of new equipment in post-war period, pointing out that water-works managers must keep abreast of times in knowledge of improved materials and equipment which will be marketed.

Management. Wartime Administrative Problems of Dallas City Water Works, H. A. Hunter, *Am. Water Works Assn.—J.*, vol. 35, no. 1, Jan. 1943, pp. 73–76. General problems facing water-works managements concerning men, money, and materials; review of such problems in Dallas and how they are being met.

Public Utilities, Protection. Practical Aspects of Guarding Utility Properties, G. A. Hunt. *Am. Water Works Assn.—J.*, vol. 35, no. 1, Jan. 1943, pp. 65–68. Problems confronting average utility management in protecting services from sabotage; author is of opinion that utility-employed guards present most adequate solution to problem and discusses organization, duties, training, and placement of such guards.

Tampa, Florida. Price Control on Wartime Water-Works Project, G. E. Hands. *Am. City*, vol. 58, no. 3, Mar. 1943, pp. 40–41 and 71. Tampa, Fla., saves $167,000 by careful engineering and management on vital municipal construction; effect of war; contract negotiations; construction problems; pressures and services improved.

Tanks and Towers, Design. Timber Tower for 50,000-Gal. Tank. *Eng. News-Rec.*, vol. 130, no. 4, Jan. 28, 1943, p. 143. Detail design data, principal dimensions, and spacings for 60-ft high timber tower to support 50,000-gal water tank; tank assembly method.

Tanks, Steel. Expansion and Contraction Joint for Tanks, R. T. Logeman. *Wisconsin Engr.*, vol. 47, no. 4, Jan. 1943, pp. 13–15 and 28. Details of improvement in design of steel storage tanks to prevent failures due to over-stressing certain portions that become definitely and critically vulnerable when subjected to drop in temperature.

Water Wells, Lebanon, Ohio. Changing from Artesian to Deep Well Service, L. F. Wertz. *Pub. Works*, vol. 74, no. 2, Feb. 1943, pp. 34, 36, and 38. Lebanon (Ohio) village of 400 inhabitants, obtains water supply from series of driven wells, all located on 4-acre tract, half mile west of town; falling ground-water level necessitated changing from surface to deep-well pumps, which was done without interrupting service; manner in which work was accomplished.

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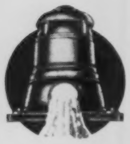

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Available in capacities from 8 to 25 cu ft, the scoop is designed to speed handling of such materials as ore, glass and metal scrap, foundry sand and bulk chemicals. Manually controlled, it can pick up or dump materials at any point within the lift range. An optional feature is an anti-spilling device. Further information may be had by writing to the manufacturer.

Metal Coating Sprayer

A NEW METHOD FOR RAPIDLY applying a protective metal coating to metal assemblies or structures, of re-coating areas burned by welding, of patching or repairing small areas in large galvanized assemblies where the coating has been damaged, and of providing a base for painting, is announced by Alloy-Sprayer Company, 2040 Book Bldg., Detroit, Mich.

It is claimed that an actual tinning of the sprayed metal with the base metal is effected by this process, which consists of spraying the surface to be protected with a coating of Galv-Weld metal by means of an Alloy-Sprayer gun. The gun, a portable, self-contained unit, has a thermostatically controlled metal melting pot and a means of atomizing and spraying the molten metal by air under pressure, and is sufficiently light to be manipulated by hand.

Asbestos-Cement Conduit

MANY ADVANTAGES are claimed for an asbestos-cement conduit, intended principally for cable installation, now produced by The Philip Carey Mfg. Co., Lockland, Cincinnati, Ohio.

An outstanding feature of the conduit is the "Flexcaulk" coupling, which consists of a tubular housing of blow-resisting asbestos-cement, to which is bonded a liner of mineralized asphalt compound. Because of its special construction, this coupling is said to add a new flexibility without sacrificing strength, and to permit a self-aligning, water-tight joint of exceptional quality.

The asbestos-cement conduit itself, besides requiring no critical materials, is said to be exceptionally tough and strong, meeting the demand for an earth-enveloped duct system that is permanent, trouble-free, and proportionately inexpensive in its initial installation.

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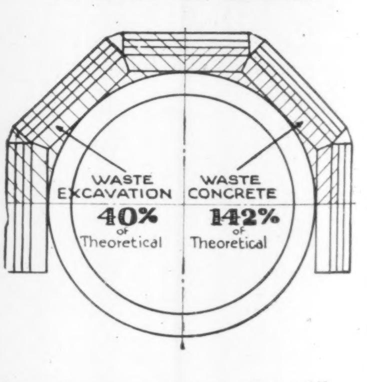

The above cross section illustrates how excess excavation and concrete can be eliminated by replacing timbers with "Commercial" plates.

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★ Last year saw nearly 30,000,000 workers voluntarily buying War Bonds through some 175,000 Pay-Roll Savings Plans. And buying these War Bonds at an average rate of practically 10% of their gross pay!

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Sure, there is—but how long is it since *you've* done anything about it? These plans won't run without winding, any more than your watch! Check up on it today. If it doesn't show substantially more than 10% of your plant's pay-roll going into War Bonds, it needs winding!

And you're the man to wind it! Organize a vigorous drive. In just 6 days, a large airplane manufacturer increased his plant's showing from 35% of employees and 2½% of pay-roll, to 98% of employees and 12% of pay-roll. A large West Coast shipyard keeps participation jacked up to 14% of pay-roll! You can do as well, or better.

By so doing, you help your nation, you help your workers, and you also help yourself. In plant after plant, the successful working out of a Pay-Roll Savings Plan has given labor and management a common interest and a common goal. Company spirit soars. Minor misunderstandings and disputes head downward, and production swings up.

War Bonds will help us win the war, and help close the inflationary gap. And they won't stop working when victory comes! On the contrary—they will furnish a reservoir of purchasing power to help American business re-establish itself in the markets of peace. *Remember, the bond charts of today are the sales curves of tomorrow!*

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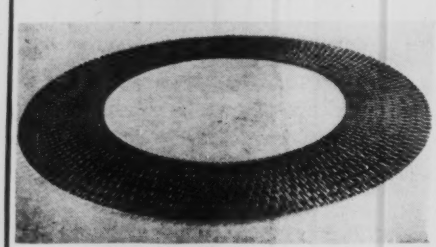

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Photoelastic
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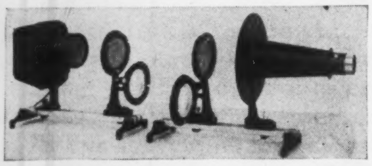

To the machine designer, photoelastic stress analysis is not only of value in the verification of calculations based on theoretical solutions, but also in the solution of problems where theoretical analysis is not available. Where weight and space must be conserved actual stress distribution is more important than stress indicated by theoretical analysis.

In the new model polariscope of 4$^{1}/_{4}$" clear aperture, the parallel beam is collected by a rear element and condensed through a three component lens of the Cooke system. In the new larger unit (8$^{1}/_{4}$" aperture) a four component lens of the Omnar system is used. *The image is sharp throughout the field, free of aberration, astigmatism and distortion.*

Literature of new model polariscope now available

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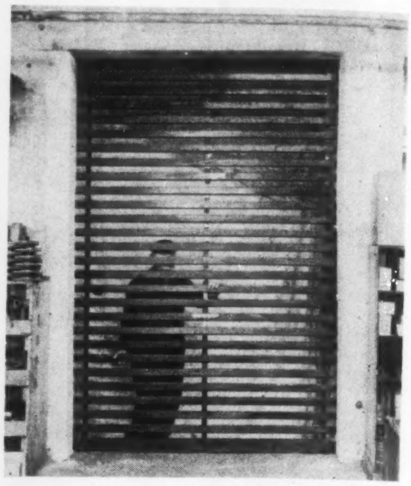
* *T. M. Reg. U. S. Pat. Off. by Polaroid Corporation*

Rolling Wood Grille

A NEW ROLLING WOOD GRILLE, or barrier, has just been announced by Cornell Iron Works, Inc., Long Island City, N.Y. This product uses wood bars strung on light steel tapes operating up and down in wood guides, and requires the minimum amount of critical material. The grille coils overhead on a horizontal counterbalancing shaft, no wall or floor space being taken up. It can be fabricated for opening widths up to 19 ft and opening heights unlimited. Operation is either push up, or for larger sizes, by hand chain or electric motor. The wood rolling grille locks into the side guide with a padlock and hasp on the bottom bar. It offers the advantage of being replaceable with a rolling steel grille at a later date if desired.



Tank Linings

A METHOD OF BONDING solid sheets of Koroseal directly to the welded steel, wood, or concrete of tanks, and thus extending the application of tank linings into fields which rubber cannot handle because of physical limitations is announced by The B. F. Goodrich Co., Akron, Ohio.

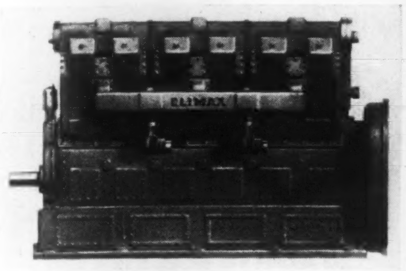
Koroseal is a synthetic elastic material with many rubber-like properties; its principal advantage in tank lining is said to be its remarkable resistance, but the company points out that the material has certain limitations and it is essential that company engineers be furnished complete service details before it can be recommended.

Other advantages of the lining are cited as follows: It can be applied in thicknesses up to and including $^{3}/_{32}$ in.; is not subject to physical damage and pinhole leaks; is more resistant to abrasion than corrosion-resistant paint films; is readily repaired if damaged; has high electrical resistivity and prevents current losses in electrolytic action; can be easily tested for leaks with an electrical tester; and is highly resistant to oxidation, water, sunlight, and gas diffusion.

High-Speed Gas Engine Uses Low-Cost Local Fuels

Climax Engineering Company, Clinton, Iowa, announces the V-12 Blue Streak Engine, with a normal speed range of 600 to 1200 rpm and a broke hp of 435, built to meet to-day's demands for a high-speed engine which will mesh with modern power-consuming machinery for rock or oil drilling, operating large pumps and compressors, driving mining and construction machinery, and, with suitable generators, provide a low-cost means of generating electric power.

Outstanding characteristics claimed for the V-12 are: Wide fuel range (natural gas, butane, gasoline or other fuels); economical dual carburetion; perfect turbulence due to specially shaped combustion chamber; high capacity cooling system; infrequent and low cost maintenance. It is available in two bores, $6^1/_2$ in. and 7 in., with three types of dual ignition. Standard design features include wet cylinder sleeves, seven-bearing crankshaft, overhead valves, aluminum (5 ring) piston, rifle-drilled connecting rod and fuel change-over devices. A complete range of accessory equipment to meet specific needs can be furnished.



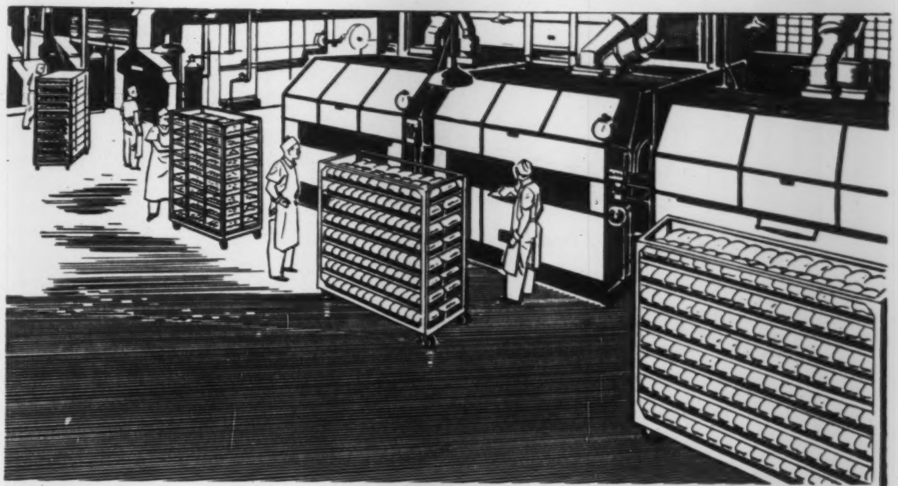
Literature Available

Bolt and Screw Anchors—A handy, ready reference, "Expansion Bolt and Screw Anchor Dimensional Chart," has just been issued by The Rawlplug Company, Inc., 98 Lafayette St., New York, N.Y.

Construction Equipment—Catalog No. 600, Second edition, covering compressors, Diesel engines, rock drills, wagon drills, demolition tools, diamond drills, pneumatic tools, concrete vibrators, and electric tools, has just been published by Chicago Pneumatic Tool Company, 6 East 44th St., New York, N.Y.

Demineralizing Problems—Process industries requiring water as pure as distilled water, free from electrolytes (both cations and anions), and those process industries in which electrolyte removal from various types of solutions is desirable, may find useful a paper on "Demineralizing Solutions by a Two-Step Ion Exchange Process," available from The Permutit Company, 330 West 42nd St., New York, N.Y.

Electric Tools—A 20-page, pocket-size manual, Booklet No. JE-199, detailing how to get maximum service from portable electric tools, is now offered by the Independent Pneumatic Tool Company, 600 West Jackson Blvd., Chicago, Ill.



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FLOATING FLOORS—used a lot in bakeries—have a hardwood surface over a treated wood subfloor. Sand between this and the concrete serves as a cushion. These floors stand up well under the wear and tear of service. The heavy pan trucks and racks roll more easily on them. The floors are warm and quiet, contributing to happier working conditions.

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ENGINEERS MUST HAVE FACTS!

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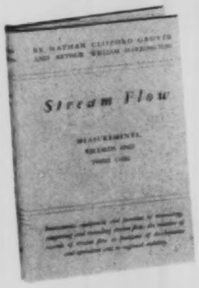
*

STREAM FLOW

Measurements, Records, and Their Uses

By N. C. Grover and A. W. Harrington



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An important book for engineers who, on the home front, must have accurate records if they are to utilize our rivers successfully for purposes of transportation, generation of electricity or irrigation and drainage.

To help engineers in the control, utilization, or administration of river waters—this book treats primarily of the instruments, equipment, and processes used to obtain stream-flow records. It thoroughly covers field work related to the systematic collecting of records of river discharge and runoff, and gives the office procedures utilized in computing, checking, and preparing such records for industrial purposes. Throughout, numerous references are made to current engineering literature.

SCOPE OF BOOK

The first part of the book shows the value of records in planning for stable local or regional development. Chapters 8–14 explain how to select sites for gaging stations—establish, equip and operate them. Next a thorough description of methods of computing results—and last how stream gaging is financed and organized in this country.

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Piping—Air Reduction Sales Company, 60 East 42nd St., New York, N.Y., offers a 16-page illustrated booklet on "The Welding of Piping."

Pumps—"How to Recondition Worn Pump Shafts and Rods" describes four different methods for renewing worn metal parts, giving step-by-step procedures. It is published by The International Nickel Co., Inc., 67 Wall St., New York, N.Y.

Pumps—"Handbook for Wartime Care of Centrifugal Pumps," Allis-Chalmers' new maintenance guide, makes specific recommendations for putting pump care on a wartime basis. Step by step a centrifugal pump is actually built, and as each part is added, the way it is built and functions are seen to determine the way it should be cared for. The new manual applies to all makes of pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Water Production for Industrial and Municipal Use—Names and practically describes a recent booklet of the Ranney Water Collector Corp., New York, N.Y. In addition to dealing with the general problem of industrial and municipal water supply, it sets forth in detail the advantages of the Ranney System, and includes complete engineering sketches and photographs.

Wire Rope Shears—Watson-Stillman Company of Roselle, N.J., have just released a new 8-page book on wire rope shears. The first section is devoted to the hand-operated shear for cutting wire rope up to $1^1/_8$ in. diameter, flat bars up to $2^1/_8 \times {}^1/_2$ in. and round bars up to $^7/_8$ in. diameter. The second section of the book is devoted to hydraulically operated shears for heavier work, up to $2^1/_2$ in. in diameter.

Wood Pipe—Chock-full of drawings and "how to" information for engineers and contractors, a new 16-page bulletin entitled "Redwood Pipe" is now being distributed by the California Redwood Association. By means of tables, text and drawings, the bulletin deals with the problem of installation of four types of redwood pipe: continuous stave pipe, machine banded pipe, bored pipe, and redwood lined metal pipe. California Redwood Association, 405 Montgomery St., San Francisco, Calif.

Wrought Iron Pipe—A colorful and easy-to-read technical bulletin entitled "Wrought Iron for Underground Services" has been released by the A. M. Byers Co., Pittsburgh, Penna. It discusses important factors affecting soil corrosion of underground piping, weighs theory against test results, and outlines installation histories of water wells, and lines, gasoline lines and tanks, and electrical cable conduit.

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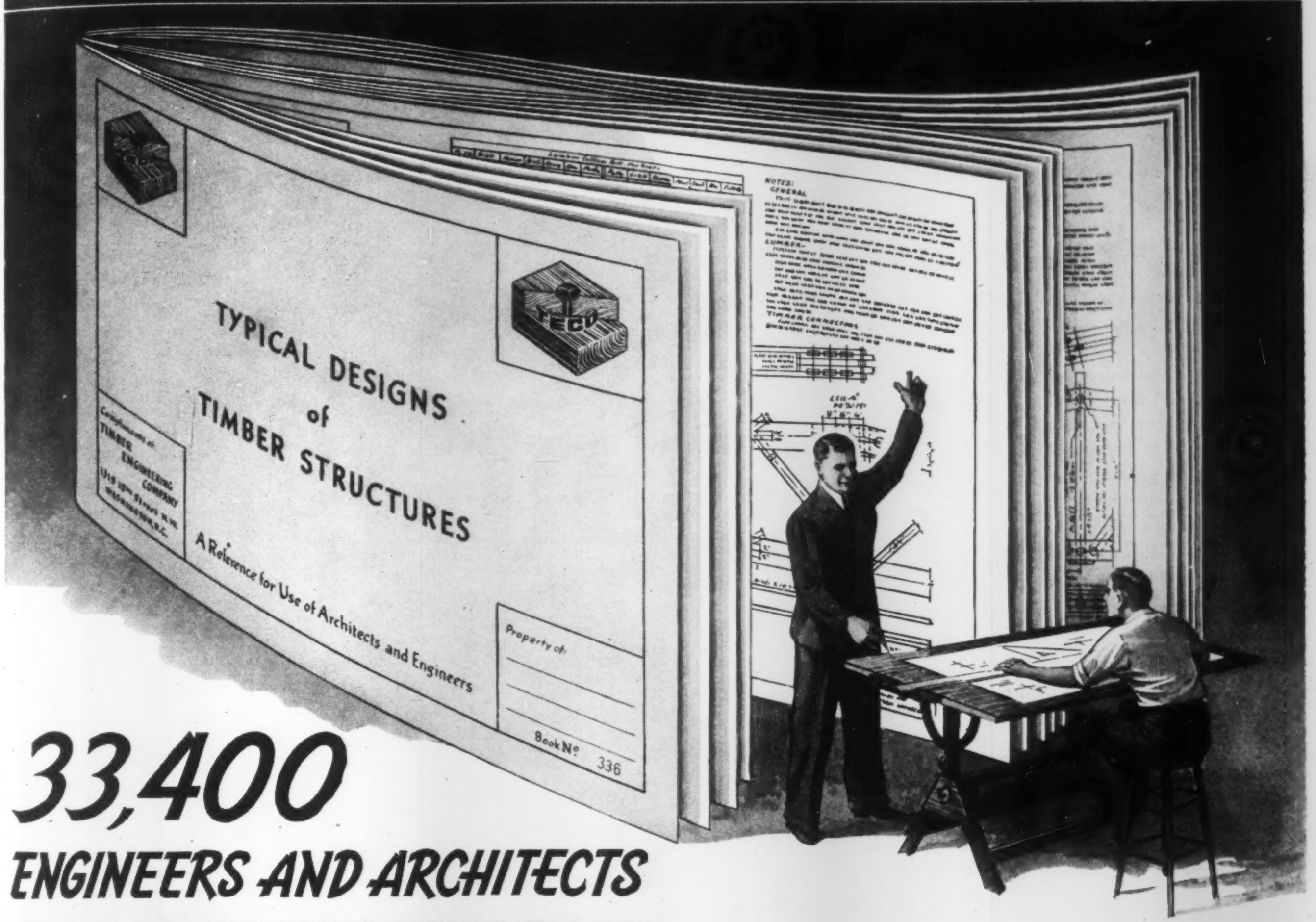
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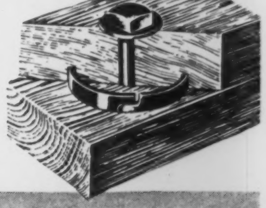

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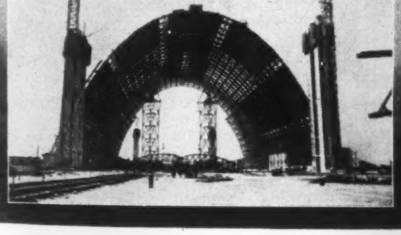
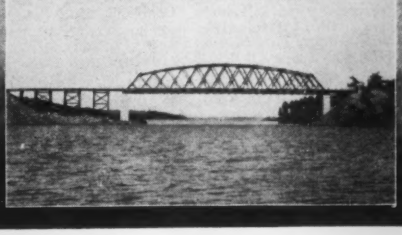




Applications for Admission or Transfer

Condensed Records to Facilitate Comment from Members to Board of Direction

June 1, 1943 Number 6

The Constitution provides that the Board of Direction shall elect or reject all applicants for admission or for transfer. In order to determine justly the eligibility of each candidate, the Board must depend largely upon the membership for information.

Every member is urged, therefore, to scan carefully the list of candidates published each month in Civil Engineering *and to furnish the Board with data which may aid in determining the eligibility of any applicant.*

It is especially urged that a definite recommendation as to the proper grading be given in each case, inasmuch as the grading must be based upon the opinions of those who know the applicant personally as well as upon the nature and extent of his professional experience. Any facts derogatory to the personal character or professional reputation of an applicant should be promptly communicated to the Board.

Communications relating to applicants are considered strictly confidential.

The Board of Direction will not consider the applications herein contained from residents of North America until the expiration of 30 days, and from non-residents of North America until the expiration of 90 days from the date of this list.

MINIMUM REQUIREMENTS FOR ADMISSION

Grade	General Requirement	Age	Length of Active Practice	Responsible Charge of Work
Member	Qualified to design as well as to direct important work	35 years	12 years	5 years RCM*
Associate Member	Qualified to direct work	27 years	8 years	1 year RCA*
Junior	Qualified for subprofessional work	20 years	4 years	
Affiliate	Qualified by scientific acquirements or practical experience to cooperate with engineers	35 years	12 years	5 years RCM*

* In the following list RCA (responsible charge—Associate Member standard) denotes years of responsible charge of work as principal or subordinate, and RCM (responsible charge—Member standard) denotes years of responsible charge of IMPORTANT work, i.e., work of considerable magnitude or considerable complexity.

APPLYING FOR MEMBER

Adams, John Middleton (Assoc. M.), Seattle, Wash. (Age 51) (Claims RCA 9.4 RCM 6.5) June 1941 to date Constr. Engr., FWA, Seattle, Wash.; previously Engr., Pendleton (Ore.) Water Comm.; Engr. Inspector, PWA, Portland, Ore., and San Francisco, Calif.

Adams, Rob Roy (Assoc. M.), Greenville, S.C. (Age 43) (Claims RCA 8.4 RCM 9.1) Feb. 1923 to date with J. E. Sirrine & Co., Engrs., in various capacities, at present as Engr.

Beaulieu, Arthur George, New Haven, Conn. (Age 45) (Claims RCM 17.7) 1935 to date Chf. Structural and Civ. Engr., Westcott & Mapes, Inc., Archts. and Engrs., New Haven.

Bederman, Nathan Berwin, Camp Peary, Va. (Age 42) (Claims RCA 0.5 RCM 21.7) March 1943 to date Civ. Engr. (rank of Lieut. Comdr.). U.S.N.R., Constr. Bn., CEC; previously Secy. and Treas., Arcole Constr. Co.; Pres. and Chf. Engr., Midwest Constr. & Asphalt Co.

Black, Joseph Kenneth (Assoc. M.), Lenoir City, Tenn. (Age 43) (Claims RC 13.2 D 1.3) April 1934 to date with TVA, as Chf. of Party and Shift Inspector, Associate Civ. Engr., Asst. Constr. Engr., Constr. Engr., and (since Jan. 1942) Project Mgr.

Burr, George Sanford, Plymouth, Mich. (Age 46) (Claims RCM 15.5) Dec. 1921 to date with Wayne County Road Comm., Detroit, Mich., as Transitman, Chf. of Party, Asst. Maintenance Engr., and (since April 1938) Engr. of Tests and Inspection.

Burrell, Harold Portal, Darien, Conn. (Age 60) (Claims RCM 27.2) April 1936 to Sept. 1938 and Jan. 1939 to date Chf. Engr., Western Foundation Co. and Western Concrete Pile Corporation, Chicago and New York City; in the interim with John Monks & Son, New York City.

Burris, Michael Murray, Englewood, N.J. (Age 49) (Claims RCA 9.0 RCM 15.8) April 1926 to date in private practice as Landscape and Civ. Engr., since Jan. 1928 as Michael M. Burris, first practicing at Trenton, N.J., and after April 1930 at Englewood, N.J

Carnine, James Harrison Indianapolis, Ind. (Age 50) (Claims RCA 3.3 RCM 28.9) Oct. 1929 to date Pres., Eng. Metal Products Corporation.

Coolidge, Warren Algernon (Assoc. M.), Nashville, Tenn. (Age 43) (Claims RCA 9.7 RCM 7.0) Sept. 1924 to date with Vanderbilt Univ., successively as Instructor in, Asst. Prof., Associate Prof., and (since June 1938) Prof. of, Civ. Eng.

Dempster, Andrew Marsden Gresham, Canterbury, Vict., Australia. (Age 44) (Claims RC 14.0 D 17.0) Feb. 1942 to date with Sverdrup & Parcel, Cons. Engrs. to U.S. Army in Australia, as Designing Engr., and (since Oct. 1942) Asst. Engr. Consultant; previously with Victorian Country Roads Board, as Asst. Engr., and Bridge Engr.

Dickeman, Charles Theodore (Assoc. M.), Davisville, R.I. (Age 48) (Claims RCA 14.0 RCM 8.6) Sept. 1921 to date with U.S. Navy (CEC), as Asst. Public Works Officer, Public Works Officer, Plant Supt., Project Mgr., Representative, and (since June 1942) Officer in Charge at U.S. Naval Advance Base Depots, first at Gulfport, Miss., and at present at Davisville, R.I.; also Capt., CEC, U.S. Navy.

Dunlap, Merritt Sigsbee, Cudahy, Wis. (Age 36) (Claims RCA 2.0 RCM 6.3) Feb. 1941 to date with U.S. Army, as Constr. QM., Asst. Area Engr., and (since July 1942) Area Engr.; Major, Corps of Engrs.; previously with Metropolitan Water Dist. of Southern California in various capacities.

Fowler, Homer Edison (Assoc. M.), St. Paul, Minn. (Age 46) (Claims RCA 5.6 RCM 15.8) June 1936 to date Dist. Maintenance Engr., U.S. Public Roads Administration.

Fuller, Bernard Roy, Knoxville, Tenn. (Age 56) (Claims RCA 5.7 RCM 21.0) Aug. 1935 to date with TVA, as Associate Hydr. Engr. and (since Jan. 1942) Hydr. Engr.

Greve, Frederick William, West Lafayette, Ind. (Age 57) (Claims RCA 11.0 RCM 15.7) Oct. 1911 to date with Purdue Univ., as Instructor, Asst. Prof., Associate Prof., and (since Sept. 1927) Prof., of Hydr. Eng.

Hadley, Witt William, Indianapolis, Ind. (Age 50) (Claims RCM 33.9) Nov. 1920 to date Engr. of Bridge Constr., Indiana Highway Comm.

Haselton, Gage (Assoc. M.), Portland, Ore. (Age 62) (Claims RCA 9.8 RCM 23.0) March 1905 to Aug. 1909 and Nov. 1916 to date Asst. Engr., Southern Pacific R.R. Co.

Hatch, Arthur Selden, Houston, Tex. (Age 51) (Claims RCA 6.5 RCM 8.1) 1931 to date with Houston Water Dept., in various capacities, at present as Distribution and San. Engr.

Howe, Joseph Warner (Assoc. M.), Iowa City, Iowa. (Age 41) (Claims RCA 9.1 RCM 5.3) Sept. 1929 to date with State Univ. of Iowa, as Asst. Prof., Associate Prof., and (since Oct. 1942) Prof. and Head, Dept. of Mechanics and Hydraulics.

Johnston, Bruce Gilbert (Assoc. M.), Silver Spring, Md. (Age 37) (Claims RCA 5.2 RCM 5.0) March 1943 to date Senior Engr., The Johns Hopkins Laboratory of Applied Physics, Silver Spring, Md.; previously Engr., Designing Engr's. Office, Bureau Yards & Docks, U.S. Navy; Asst. Prof. and Asst. Director of Fritz Laboratory, and Associate Prof. and Associate Director, Lehigh Univ.

Jones, Arvon Stanley, Des Moines, Iowa, (Age 46) (Claims RCA 6.0 RCM 6.6) Feb. 1919 to date (intermittently) with City of Des Moines, as Draftsman, Designer, and (since April 1937) Designing Engr.; in the interim Draftsman, Des Moines Steel Co.; Civ. Engr., Office of State Archt., Des Moines.

Kimmel, Willis Doyle, Milwaukee, Wis. (Age 48) (Claims RCA 6.1 RCM 19.6) Sept. 1934 to March 1937 Field Engr., and March 1937 to date Dist. Engr., Milwaukee Dist., Portland Cement Association, Detroit, Mich.

Knox, John James (Assoc. M.), Bayside, N.Y. (Age 36) (Claims RCA 4.5 RCM 6.9) Nov. 1931 to date with Interborough Rapid Transit Co. (since June 1940 IRT Div. of New York City Transit System), as Transitman, Asst. Engr., and (since Jan. 1938) Asst. to Road Engr.

Levine, Ernest, Los Angeles, Calif. (Age 35) (Claims RCM 6.4) Jan. 1937 to date member of firm, Harry Friedman and Mac J. Friedman, Associates, Los Angeles.

Lewin, Joseph David (Assoc. M.), Brooklyn, N.Y. (Age 37) (Claims RCA 5.7 RCM 5.9) July 1942 to date Dept. Head, Becker, Simpson & Gladeck, Cons. Engr.; previously Designing Engr., Sanderson & Porter; Asst. Engr., Grade 4, later Civ. Engr., Board of Water Supply, all of New York City; Associate Engr., U.S. Engrs., Boston; Cons. Engr. (private practice).

Peck, Rexford Ernest (Assoc. M.), Mobile, Ala. (Age 47) (Claims RCA 12.6 RCM 5.9) Feb. 1943 to date Bridge Engr., Gulf, Mobile & Ohio R.R. Co.; previously with Bridge Dept., Missouri Pacific R.R. Co., as Asst. Engr. and Chf. Draftsman.

Pfau, Albert Lincoln, Jr. (Assoc. M.), St. Petersburg, Fla. (Age 52) (Claims RCA 8.2 RCM 15.6) Nov. 1942 to date with U.S. Engrs., Key West, Fla., since Dec. 1942 being Prin. Engr.; previously in private practice of civil engineering, architecture, and surveying.

Plummer, Horace Edwards (Assoc. M.), Portland, Ore. (Age 64) (Claims RCA 15.0 RCM 20.0) June 1911 to date Inspector of Bldgs., Portland.

Prouty, Frank Harrison, Denver, Colo. (Age 51) (Claims RCA 0.7 RCM 19.8) 1924 to date with Prouty Bros. Eng. Co. and Industrial Appraisal Co., since Oct. 1940 as Archt.-Engr.

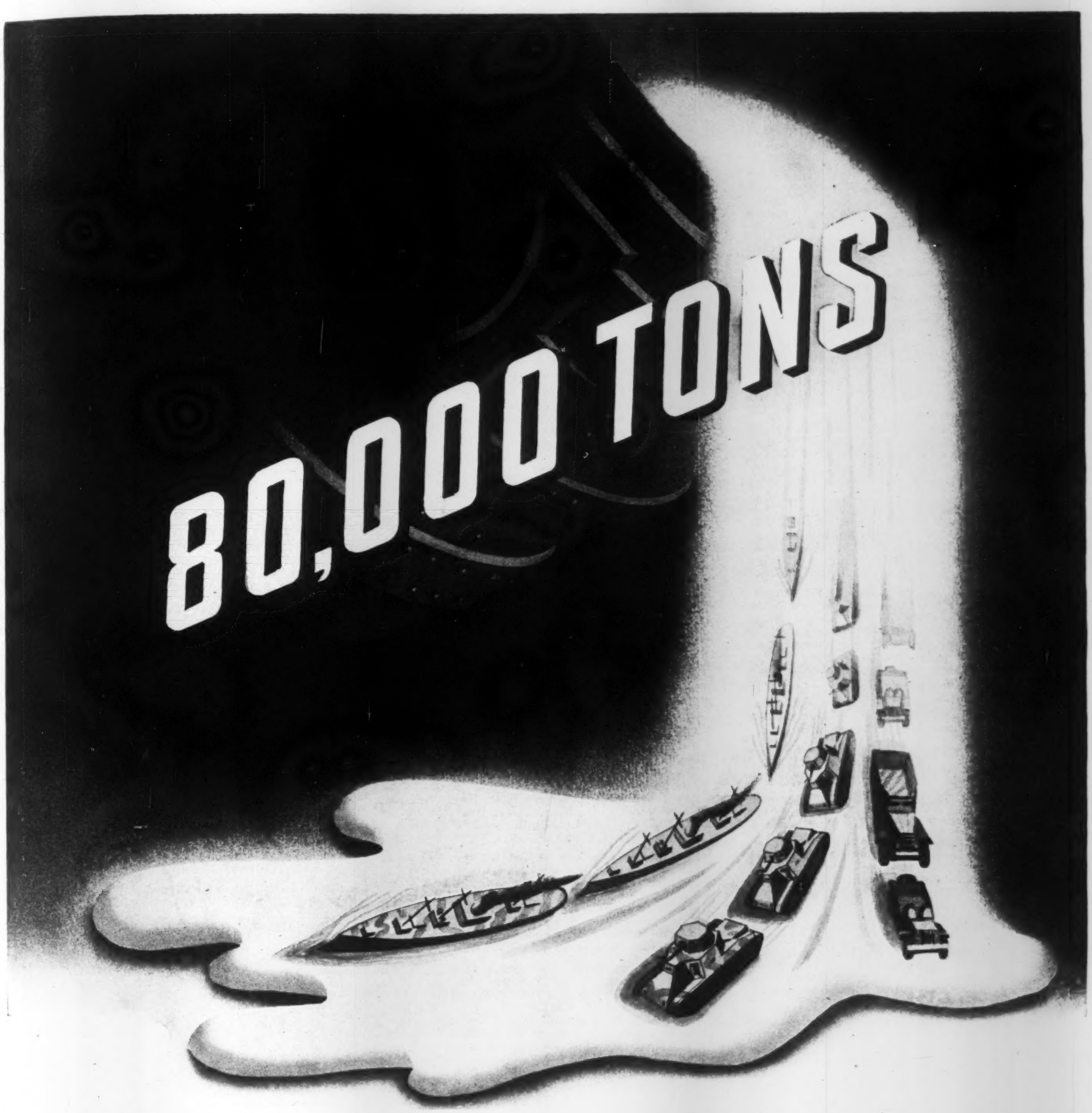
Rohwer, Carl (Assoc. M.), Ft. Collins, Colo. (Age 52) (Claims RCA 11.0 RCM 14.7) April 1914 to date with U.S. Dept. of Agriculture, in various capacities, since March 1937 as Irrigation Engr.

Rounthwaite, John Mawson, Newcastle-Upon-Tyne, England. (Age 59) (Claims RCA 3.0 RCM 23.0) 1940 to date Superintending Civ. Engr., with British Admiralty; previously (intermittently) in private practice as Cons. Engr., also Archt.

Schwalen, Harold Christy (Assoc. M.), Tucson, Ariz. (Age 47) (Claims RCA 10.4 RCM 10.5) June 1917 to date with Univ. of Arizona teaching irrigation engineering, and finally Prof. of Agri. Eng. and Associate Agri. Engr.; since Nov. 1942 on leave from Univ. as Senior Irrigation Engr., Emergency Rubber Project, Div. of Surveys and Investigations, U.S. Dept. of Agriculture.

Seymour, Harold James (Assoc. M.), Elizabeth, N.J. (Age 52) (Claims RCA 6.0 RCM 28.0) April 1909 to April 1911 Res. Engr. and April 1915 to date Chf. Asst. City Engr., Elizabeth, N.J.

Soltau, David Livingstone (Assoc. M.), Los Angeles, Calif. (Age 52) (Claims RCA 4.1 RCM 13.4) Sept. 1941 to date Coordinator, Engineering, Science and Management War Training Program, Univ. of Southern Cali-



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fornia; previously student, EDT course in aeronautical engineering, at California Inst. of Technology; Registrar, Westmont Coll., Los Angeles; Pres., and Instructor of Physics and Mathematics, Lower Columbia Junior Coll., Longview, Wash.

Sparks, Thomas Carr (Assoc. M.), Baltimore, Md. (Age 38) (Claims RCA 6.1 RCM 7.6) March 1923 to date with Baltimore & Ohio R.R. Co., in various capacities, and since Oct. 1935 Field Engr. ($3\frac{3}{8}$ years) and Industrial Engr. (4 years).

Stanley, Lewis Adams, Salem, Ore. (Age 46) (Claims RCA 8.2 RCM 13.8) April 1942 to March 1943 Locating Engr. (Senior Supt.), U.S. Engr. Dept.; previously Engr., Hydroelectric Comm. of Oregon.

Steeg, Henry Bell (Assoc. M.), Indianapolis, Ind. (Age 42) (Claims RCA 4.3 RCM 14.6) Jan. 1939 to date member of firm, Henry B. Steeg & Associates, Indianapolis; previously City Civ. Engr., Indianapolis.

Turner, William Lawrence, St. Clairsville, Ohio. (Age 43) (Claims RCA 1.8 RCM 17.9) Jan. 1933 to Jan. 1941, Dec. 1941 to March 1942 and Nov. 1942 to date Asst. Engr., Belmont County, Ohio; in the interim Eng. Draftsman, Morganfield (Ky.) Archt.-Engrs.; Project Engr. and Supt., WPA, Ohio Dist. No. 3.

van der Boon, Georges Firmin Jean, New York City. (Age 46) (Claims RCA 7.8 RCM 12.7) Sept. 1942 to date 1st Lieut., Corps of Engrs., U.S. Army, Ft. Jay, New York; previously Civ. Engr., Dept. of Public Works, New York City.

Wehmeyer, Joe LaMar, Detroit, Mich. (Age 49) (Claims RCA 9.9 RCM 13.3) June 1920 to date with Board of County Road Commrs., Wayne County, Detroit, as Res. Engr., Surveyor, and (since Dec. 1930) Engr. of Safety and Traffic.

Woods, Edwin Marechal (Assoc. M.), Leonardtown, Md. (Age 41) (Claims RCA 5.6 RCM 6.9) July 1942 to date Chf. Structural Engr. and (at present) Chf. Field Engr. on construction of an air base for U.S. Navy; previously Asst. Executive Secy., National Soc. of Professional Engineers, Washington, D.C.; Civ. Engr., War Dept., Washington, D.C.

Zweig, Alfred, Detroit, Mich. (Age 39) (Claims RCA 3.8 RCM 10.7) 1938 to date Designer for Albert Kahn, Associated Archts. and Engrs.

APPLYING FOR ASSOCIATE MEMBER

Anderson, William Ernest, Montrose, Colo. (Age 33) (Claims RCA 8.9) Aug. 1935 to date Engr., U.S. Dept. of Agriculture, SCS.

Atkin, Morris (Junior), New York City. (Age 31) (Claims RCA 2.0) Jan. 1940 to June 1941 Draftsman and June 1941 to date Structural Designer, Anaconda Copper Mining Co.; previously Jun. Engr., New York City Tunnel Authority.

Bamberger, Sidney Francis (Junior), Stockton, Calif. (Age 31) (Claims RCA 4.4 RCM 4.0) May 1942 to date Chf. Structural Engr., Pollock-Stockton Shipbuilding Co.; previously with Mark Falk, Cons. Structural Engr., as Designing Structural Engr., and finally Chf. Engr.

Benson, Robert Elmo, Los Angeles, Calif. (Age 39) (Claims RCA 4.9) March 1943 to date Associate Hydr. Engr., Hydr. and San. Div., Dept. of Agriculture, Forest Service, Emergency Rubber Project; previously Associate Civ. Engr., 11th Naval Dist., Public Works Office, San Diego; Senior Engr., U.S. Engr. Corps; Civ. Engr., for Lippincott & Bowen and for Homer Dulin Co.; Draftsman and Chf. Draftsman, Shell Oil Co., Long Beach.

Brandt, Robert Francis, Pittsburgh, Pa. (Age 33) (Claims RCA 3.0) Aug. 1942 to date Asst. Engr. with Morris Knowles, Inc., Engrs.; previously Corps of Engrs., War Dept., U.S. Army, and Mississippi River Comm., Lower Mississippi Valley Div., Vicksburg, Miss.; Senior Asst. Engr., Civ. Eng. Dept., Pennsylvania Edison Co., Altoona, Pa.

Coffey, Philip John (Junior), Managua, Nicaragua. (Age 32) (Claims RCA 4.9 RCM 0.7) Sept. 1942 to date 1st Lieut., San. Corps, U.S. Army; previously with U.S. Public Health Service, successively as Jun. San. Engr., Asst. Public Health Engr., and Asst. San. Engr.

Collins, George Fred, Kew Gardens, N.Y. (Age 30) (Claims RCA 1.3) Dec. 1942 to date Expediter, Merritt, Chapman & Scott, Escanaba, Mich.; previously with Drydock Associates, as Field Engr., and Chf. Field Engr.; Chf. of Party, Spencer, White & Prentis, New York City.

Conner, DeWitt Lyons, Minneapolis, Minn. (Age 37) (Claims RCA 8.0) Sept. 1940 to date Field Engr. and Asst. Supt., Fegles Constr. Co., Ltd., Minneapolis; previously Supt. of Constr., National Park Service, Minnesota.

Dekema, Jacob (Junior), Los Angeles, Calif. (Age 27) (Claims RCA 1.5) June to July 1937 and June 1938 to date with California Div. of Highways, as Senior Eng. Aide, Jun. Bridge Engr., and (at present) Asst. Bridge Engr.; in the interim Eng. Clerk, Los Angeles County Bldg. Dept.

Emery, Nathan Stone, Ft. Lauderdale, Fla. (Age 37) (Claims RCA 2.6 RCM 12.4) Nov. 1925 to date with Florida Road Dept., in various capacities, since Oct. 1941 as Div. Engr.

Feren, John Michael (Junior), Edmonton, Alberta, Canada. (Age 30) (Claims RCA 7.7 RCM 1.1) Dec. 1942 to date with J. Gordon Turnbull and Sverdrup & Parcel, A. & E. Canol Project, Canada & Alaska, as Eng.-Estimator, and at present Cost Engr.; previously with Howard, Needles, Tammen & Bergendoff, Bluebonnet Constrs., Wyandotte County, Kansas, and others.

Fish, Franklin Wakefield (Junior), Salt Lake City, Utah. (Age 33) (Claims RCA 3.4 RCM 4.9) Sept. 1940 to date with U.S. Army, as Asst. Constr. QM. (Capt.), Ft. Ord, Calif.; Constr. QM. and Area Engr. (Major), Camp Beale, Marysville, Calif., and (since July 1942) Post Engr. (Lt. Col., CEC), Kearns, Utah; previously with U.S. Engr. Dept.

Forsyth, Benjamin, Brooklyn, N.Y. (Age 36) (Claims RCA 3.0) May 1940 to date Structural Designer with F. R. Harris; previously Jun. Engr., Dept. of Public Works, New York City; Research Engr., Glavesprom Comm., New York City.

French, Earl Richard, Ashland, Mass. (Age 35) (Claims RCA 7.4 RCM 0.4) Nov. 1940 to date Designer-Checker, Stone & Webster Eng. Corp., Boston; previously Designer-Draftsman, Boston, Mass., with E. B. Badger & Sons Co., and with New England Power Service Co.

Gleason, Robert Joseph, Denver, Colo. (Age 35) (Claims RCA 3.0 RCM 3.5) Sept. 1942 to date Prin. Asst. San. Engr., U.S. Public Health Service, Dist. 8, Denver; previously Asst. San. Engr., Caribbean Archt.-Engr., Port of Spain, Trinidad, B.W.I.; San. Engr., New York World's Fair, Dept. of Health.

Gould, Howard Robert, Philadelphia, Pa. (Age 32) (Claims RCA 4.1 RCM 0.9) Sept. 1940 to date with Dry Dock Associates, Philadelphia (Pa.) Navy Yard, as Engr., Field Engr., Engr., and (since July 1941) Field Engr.-in-Charge; previously Draftsman and Engr., Nassau County, Mineola, N.Y.

Groth, Harold Wesley, Lakewood, Ohio. (Age 44) (Claims RCA 8.8 RCM 6.0) May 1940 to date Chf. Engr., Cleveland Metropolitan Park System; previously Asst. Engr., Consoer, Townsend & Quinlan, Cons. Engrs., Chicago, Ill.; Chf. of Div. of Lands and Waters, Iowa Conservation Comm.

Hall, Paul (Junior), Houston, Tex. (Age 29) (Claims RCA 3.3) July 1942 to date with Brown Shipbuilding Co., Houston, as Senior Material Control Engr. and Sec. Leader, Hull Structural Sec., and (since Oct. 1942) Engr. (Technical), Outfitting Div.; previously with Humble Oil & Refining Co., Houston, Tex., in various capacities, finally as Civ. Engr.

Haney, Paul Dunlap, Lawrence, Kans. (Age 32) (Claims RCA 2.4) Sept. 1934–May 1940 and Jan. 1941 to date with Kansas Board of Health, as Asst. Chemical Engr., Asst. Engr., Associate Engr., and (since Dec. 1942) Chf. Engr. and Director; in the interim Asst. San. Engr., U.S. Public Health Service, Cincinnati, Ohio.

Hiller, Vernon Thomas, Independence, Kans., (Age 35) (Claims RCA 5.4 RCM 3.3) July 1942 to date Materials and Soils Engr., Black & Veatch, Archt.-Engrs.; previously Asst. Constr. Engr., Kansas Highway Comm.

Karekin, Kissag Gregory, New York City. (Age 31) (Claims RCA 7.8) May 1943 to date Warrant Officer, CEC-V(S), USNR, Bureau of Yards & Docks; previously Senior Eng. Aide, U.S. Geological Survey, Dept. of Interior; Constr. Engr., NYA for New York City and Long Island; with Dept. of Parks, New York City.

Karpoff, Konstantine Pavlovich, Grants Pass, Ore. (Age 44) (Claims RCA 2.1) Jan. 1936 to date with U.S. Bureau of Reclamation as Levelman, Transitman, Jun. Engr., and (since May 1941) Asst. Engr.

Kinnear, Joseph Milton, Baltimore, Md. (Age 40) (Claims RCA 15.5 RCM 0.3) Aug. 1924 to date with Bureau of Water Supply, Baltimore, successively from Eng. Aide to Asst. Civ. Engr., and since June 1942 Associate Civ. Engr.

Kipfer, Howard LeVasseur, Ponca City, Okla. (Age 34) (Claims RC 3.7 D 0.3) Sept. 1937 to date (intermittently) with Continental Oil Co. as Asst. Operator and Surveyor; previously City Engr., Leonardville, Kans.; with Kansas Highway Comm.

LaForge, Harold Byron, Sacramento, Calif. (Age 44) (Claims RCA 16.1) March 1921 to date with California Div. of Highways in various capacities, at present as Asst. to Office Engr.

Lovejoy, Leonard Mark, Balboa, C.Z. (Age 34) (Claims RCA 4.9 RCM 2.1) July 1941 to date Asst. and Associate Engr. (Civ.), U.S. Div. Engr.; previously Jun. Engr. (Civ.), U.S. Dist. Engr.; with Kansas Highway Comm., in various capacities, finally as Associate Engr.

Lucas, George Michael Cohan, Salt Lake City, Utah. (Age 39) (Claims RCA 6.5) Nov. 1942 to date Project Supt., Hillyer & Lovan, Naval Section Base, Panama City, Fla.; previously on construction for Walters Constr. Co., U.S. Engr. Dept., and others; Owner and Operator of Lucas Constr. Co., Gloversville, N.Y.

McInnis, John Lawson, Jr. (Junior), Pasco, Wash. (Age 27) (Claims RCA 2.2 RCM 1.2) Sept. 1940 to date with E. I. du Pont de Nemours & Co., in various capacities, at present as Chf. Inspector; previously Asst. Engr., Ash-Howard-Needles and Tammen.

McLaughlin, Robert Edwin, St. Petersburg Fla. (Age 40) (Claims RCA 11.4 RCM 5.9) Feb. 1943 to date Asst. Chf. Engr., McCloskey & Co.; previously with Board of Education, Philadelphia, Pa., in various capacities, finally as Structural Engr.

Montgomery, Donald Roderick, Ft. Peck, Mont. (Age 34) (Claims RCA 2.5 RCM 2.4) Feb. 1943 to date 1st. Lieut., Corps of Engrs., Ft. Peck Dist. Office; previously with U.S. Engr. Dept., Ft. Peck, Mont., successively as Inspector, Asst. Engr., Asst. Civ. Engr., Associate Civ. Engr., and Civ. Engr.

Morey, Albert Anderson, Chicago, Ill. (Age 39) (Claims RCA 13.7) Aug. 1929 to date associated with Marsh & McLennan, Chicago, at present as Asst. Vice-Pres.

Parker, Stafford Hobbs, Glenside, Pa. (Age 50) (Claims RCA 3.6 RCM 2.4) May 1937 to June 1941 Structural Designer and June 1941 to date Structural Engr., United Engrs. & Constrs., Inc., Philadelphia.

Podas, Charles Robert (Junior), Minneapolis, Minn. (Age 30) (Claims RCA 4.0) April 1940 to date Asst. Engr., Ralph D. Thomas and Associates, Cons. Engrs.; previously Highway Design Engr., Pennsylvania Turnpike Comm., Harrisburg, Pa.

Poppins, Alexander John, Bagong, Victoria, Australia. (Age 31) (Claims RCA 2.9) July 1940 to Feb. 1942 Asst. Engr., and Feb. 1942 to date Constr. Supt., State Elec. Comm. of Victoria; previously Asst. Engr., Metropolitan Water, Sewerage and Drainage Board, Sydney, N.S.W.

Rodriguez, Hipolito Kwiers, Los Chorros, Venezuela. (Age 31) (Claims RCA 5.5) July 1941 to March 1943 Chf. Engr., Div. of Studies and Projects, Bureau of Reclamation, Dept. of Public Works, Caracas; previously Constr. Engr., aqueducts in various towns.

Rohbock, Walter Bernard, Fountain City, Tenn. (Age 40) (Claims RCA 11.5) 1941 to date Asst. Structural Engr., TVA; previously structural Designer and Field Design Representative, The Panama Canal; Asst. Engr., Cuyahoga County Bridge Dept., Cleveland, Ohio.

Roland, Harry Lewman, East Baton Rouge, La. (Age 40) (Claims RCA 7.0 RCM 1.0) April 1940 to date with Modjeski and Masters, Harrisburg, Pa., and (part of time) J. F. Coleman Eng. Co. (Associate) of New Orleans, La.; as Res. Engr., and since June 1941 Constr. Engr., previously with Bridge Dept., Constr. Div., Louisiana Highway Comm., Baton Rouge, La.

Schwiesow, Will Herman, Tegucigalpa, Honduras, C.A. (Age 43) (Claims RCA 4.3 RCM 0.8) March 1931 to April 1934 and July 1935 to date with U.S. PRA, in various capacities, finally as Associate Highway Engr.

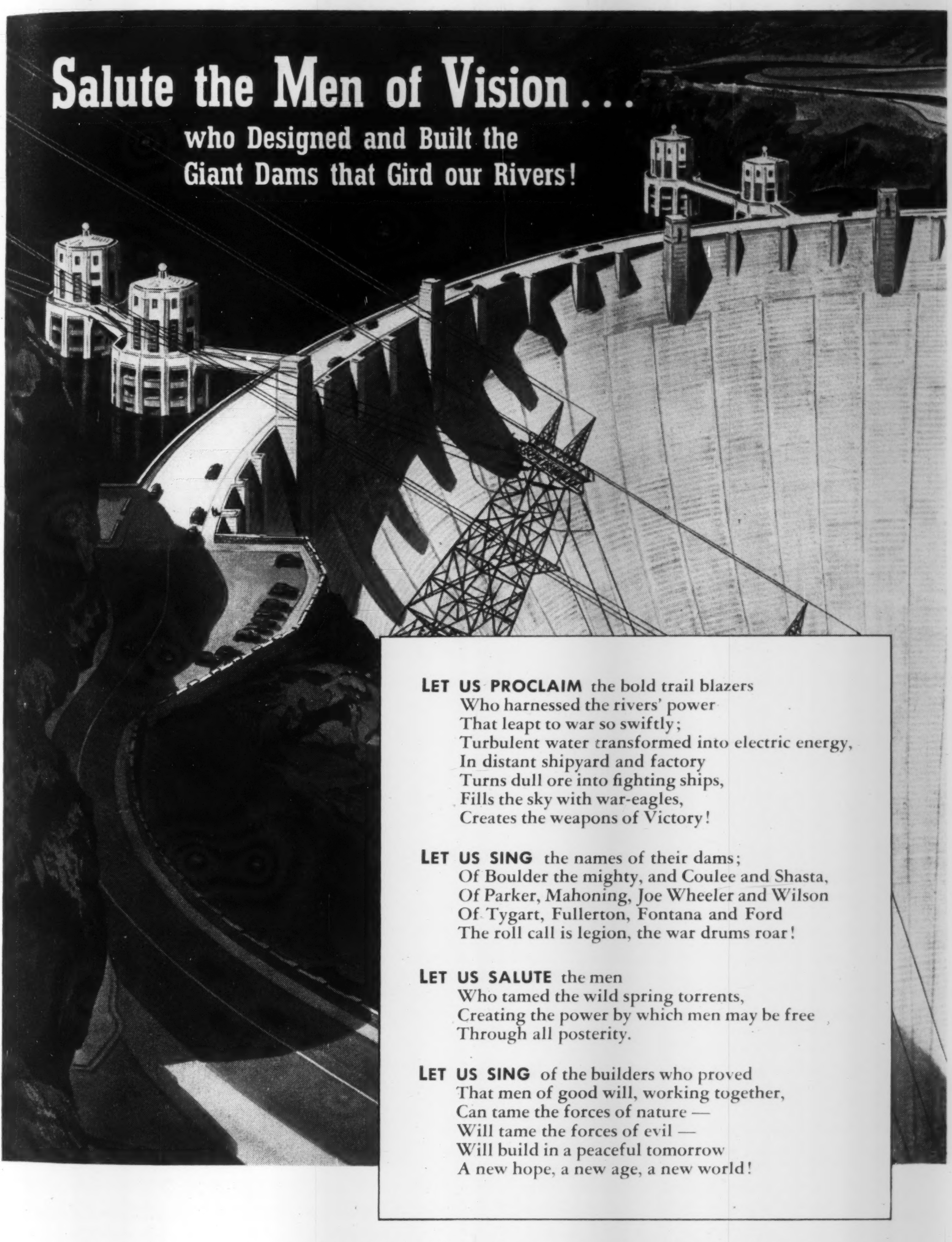
Showman, Arthur Caldwell, Sacramento, Calif. (Age 34) (Claims RCA 7.4 RCM 1.4) June 1931 to date with U.S. Engr. Office, since Oct. 1938 at Sacramento as Asst. Engr., Associate Engr., Engr., and Senior Engr.

Sinclair, William Daniel, Summerville, S.C. (Age 38) (Claims RCA 12.5 RCM 5.2) 1941 to date, with Harza Eng. Co. (2 months) and Supt. of Transmission, South Carolina Public Service Authority, Columbia; previously Engr., D. T. Duncan Eng. Co., Columbia, S.C.

Stuenkel, Paul Lloyd, Topeka, Kans. (Age 40) (Claims RCA 13.8) April 1929 to date with Kansas Highway Comm., as Levelman, Chf. of bridge survey party, and (since Aug. 1937) Senior Engr.

Weber, Carl Henry, Norfolk, Va. (Age 32) (Claims RCA 3.0 RCM 2.9) April to Oct. 1942 Lieut. (jg), and Oct. 1942 to date Lieut. (sg), CEC, U.S. Naval Reserve; previously with H. C. Weber Constr. Co., Contrs. and Engrs., as Constr. Engr., and Gen. Mgr.

Weir, Donald Arthur (Junior), Richmond, Va. (Age 33) (Claims RCA 6.9) Nov. 1938 to date with Doyle & Russell, as Field Engr., and (since Oct. 1940) Supt.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Fills the sky with war-eagles,
Creates the weapons of Victory!

LET US SING the names of their dams;
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Of Parker, Mahoning, Joe Wheeler and Wilson
Of Tygart, Fullerton, Fontana and Ford
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LET US SALUTE the men
Who tamed the wild spring torrents,
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Through all posterity.

LET US SING of the builders who proved
That men of good will, working together,
Can tame the forces of nature —
Will tame the forces of evil —
Will build in a peaceful tomorrow
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Wescott, Louis Sebastian, Oak Park, Ill. (Age 38) (Claims RCA 8.9) June 1934 to Nov. 1940 Engr., and Nov. 1940 to April 1942 Asst. Chf. Engr., Harrison Constr. Co., and April 1942 to date Chf. Engr., Henry Ericsson and Harrison Constr. Co., Pittsburgh, Pa.

White, Warren Maleleel, Houston, Tex. (Age 36) (Claims RCA 8.4 RCM 2.7) July 1941 to date member of firms, Turner & White and Turner & White, Lockwood & Andrews, and others; previously with Freese & Nichols, Archt.-Engr., Camp Barkeley, as Prin. Asst. Engr.; Prin. Asst. Engr., Koch & Fowler, Cons. Engrs., Dallas.

Wilken, Robert Henry (Junior), Fresno, Calif. (Age 28) (Claims RCA 2.2) June 1938 to date with U.S. Engr. Dept., Area Office, since March 1941 as Office Engr. and Executive Asst. to Area Engr., Fresno, Calif.

Willie, Lavern Jay (Junior), Spokane, Wash. (Age 31) (Claims RCA 2.6 RCM 1.3) Feb. 1942 to date Office Engr., United Eng. & Foundry Co.; previously with Washington Highway Dept. in various capacities, finally as Structural Steel Inspector.

Winsmore, Karl Buhre (Junior), Ridley Park, Pa. (Age 32) (Claims RCA 3.3 RCM 1.0) Oct. 1937 to March 1943 with Standard Oil Co. of Venezuela, Caripito, as Apprentice Engr., Asst. Constr. Engr., Acting Dist. Engr., and Asst. Dist. Engr.

Wotiz, Frank Burton, Charleston, W.Va. (Age 28) (Claims RCA 2.5 RCM 1.0) April 1941 to date Structural Engr., Carbide & Carbon Chemical Corporation, South Charleston, W.Va.; previously Field Engr., Skilken Bros., Columbus, Ohio; Draftsman and Field Engr., B. Krysa Constr. Co., Mor. Ostrava, Czechoslovakia.

Wright, Robert Davis, Lynchburg, Va. (Age 43) (Claims RCA 15.7) Aug. 1927 to Nov. 1942 Asst. Engr., and Nov. 1942 to date Acting Supt., City Water Dept., Lynchburg.

APPLYING FOR JUNIOR

Booth, Weldon Sutherland, New York City. (Age 26) (Claims RCA 0.2) Jan. to April 1943 Chf. of Party, Subway Constr. Co., Poe Lock, Sault St. Marie, Mich.; previously with Dry Dock Associates, Norfolk Navy Yard, Portsmouth, Va., as Asst. Chf. Field Engr., Chf. Steel Engr., and Asst. Field Supt.; Shaft Engr., Pleasantville Constrs., Delaware Aqueduct.

Cartier, Leonard, Montreal, Quebec. (Age 30) (Claims RCA 0.6) Oct. 1938 to date with L'Ecole Polytechnique, Montreal, until March 1942 as Instructor, Hydraulics Laboratory, and since March 1942 Asst. Prof. of Hydraulics.

Emberton, Raymond Basil, Ft. Belvoir, Va. (Age 22) June 1942 to date Corps of Engrs., U.S. Army, at present as Lieut.; previously with Agricultural Conservation Association of Fresno County, California.

Fong, Paul Suey, Jr., San Francisco, Calif. (Age 26) July 1942 to date Jun. Engr., Ellison & King, Cons. Structural Engrs.; previously Draftsman, and Jun. Transitman, Land Dept., Pacific Gas & Elec. Co.

Intlekofer, Charles Frederick, St. Paul, Minn. (Age 26) (Claims RCA 0.3) Sept. 1940 to date with Great Northern Ry., as Rodman, Bridge Draftsman and Concrete Inspector; previously Foreman, J. D. Armstrong Co., Ames, Iowa.

Janes, Robert Lee, Monrovia, Calif. (Age 28) (Claims RC 0.6 D 0.3) July 1941 to date Asst. Project Engr. and Project Engr., Santa Fe Dam; previously with California Div. of Highways, Fresno, Calif.; teaching fellow and graduate student, Univ. of Minnesota.

Nasburg, Edwin, Tacoma, Wash. (Age 26) Feb. 1942 to date Jun. Hydr. Engr., U.S. Geological Survey, Water Resources Branch.

Perez-Bernal, Virgilio Ernesto, Chapel Hill, N.C. (Age 25) (Claims RCA 0.3) July 1942 to date student in San. Eng. (fellowship), Univ. of North Carolina; previously with Public Works Dept., Dominican Govt. as Asst. Draftsman, Draftsman, Tech. Computer and Res. Engr.

Pierce, Guy Ellsworth, Sacramento, Calif. (Age 30) (Claims RCA 3.1) Aug. 1935 to date with County of Sacramento, as Chairman, Draftsman, Jun. Engr., and (at present) Senior Highway Engr.

Smith, Charles Joseph, Seattle, Wash. (Age 22) May 1942 to date 2d Lieut., Corps of Engrs.

Snell, Richard Dimmick, Tuckahoe, N.Y. (Age 28) At present with Fairchild Aviation Corporation, New York City; previously Designer-Draftsman, United Engrs. & Constrs., Inc., Philadelphia; Mech. Draftsman, Baldwin-Southwark Div., The Baldwin Locomotive Works, Philadelphia.

Sorensen, Robert Welby, Tooele, Utah. (Age 23) April 1942 to date Eng. Draftsman, International Smelting and Refining Co.; previously Jun. Engr., U.S. Dept. of Agriculture, SCS.

Trudeau, Joseph Raymond Marc, Montreal, Quebec. (Age 27) Sept. 1942 to date Instructor, Hydraulics Laboratory, L'Ecole Polytechnique, Montreal; previously Constr. Engr., Canadian Fairbanks Morse Co., Montreal; Field Engr., Lalonde & Valois, Cons. Engrs., Montreal.

Wallen, Avery Columbus, Asheville, N.C. (Age 30) (Claims RCA 2.4) July 1942 to date Chf. Field Draftsman, Chas. T. Main, Inc., Holston Ordnance Works, Kingsport, Tenn.; previously Asst. Engr., Six Associates, Inc., Asheville; Instrumentman, Piatt-Lee Eng. Corporation, Durham; Engr.-Draftsman, SCS, Raleigh, N.C.; Asst. Office Engr., Nantahala (N.C.) Power & Light Co.; Associate Engr. with W. T. Hall, Civ. Engr., Graham.

1942 GRADUATES

CASE SCHOOL OF APPLIED SCIENCE

(B.S. in C.E.)

	Age
Garman, Richard Franklin	(21)
Heppert, Ernest David, Jr.	(21)
Krickenberger, Custer Franklin, Jr.	(22)
Nyerges, Gilbert Arthur	(22)
Olesen, Robert John	(23)
Panek, Richard Emil	(20)
Slater, Wilson David	(23)
Sowers, George Frederick	(21)
Symes, Lester Howard	(24)

(B.S. in San. Eng.)

Stock, John Samuel	(21)
Wischmeyer, William Jorgensen	(21)

1943 GRADUATES

UNIV. OF ALA.

(B.S. in C.E.)

Richards, Arthur Haywood	(28)
Stanton, Irving Richard	(22)

CATHOLIC UNIV. OF AMERICA

(B.C.E.)

Daly, Francis Joseph	(22)

UNIV. OF CIN.

(C.E.)

Howe, Robert Theodore	(22)
Wichman, James Robert	(23)

COLO. STATE COLL.

(B.S. in C.E.)

Bostrom, William Harding	(22)
Legler, Fred Davis	(22)
Richards, Jack Edward	(22)
Schulz, Edmund Frederick	(22)

CORNELL UNIV.

(B.C.E.)

Cohen, Jerry	(20)

UNIV. OF DAYTON

(B.C.E.)

Rist, Donald Edward	(22)
Schmidt, Robert James	(21)
Wong, Anthony Buck-Lock	(22)

UNIV. OF ILL.

(B.S. in C.E.)

Hofmann, Robert	(22)
Randall, Robert Henry	(21)

IOWA STATE COLL.

(B.S. in C.E.)

Barnes, James Alan	(22)
Fagre, Roland Arthur	(21)
Granstrom, Marvin Leroy	(22)
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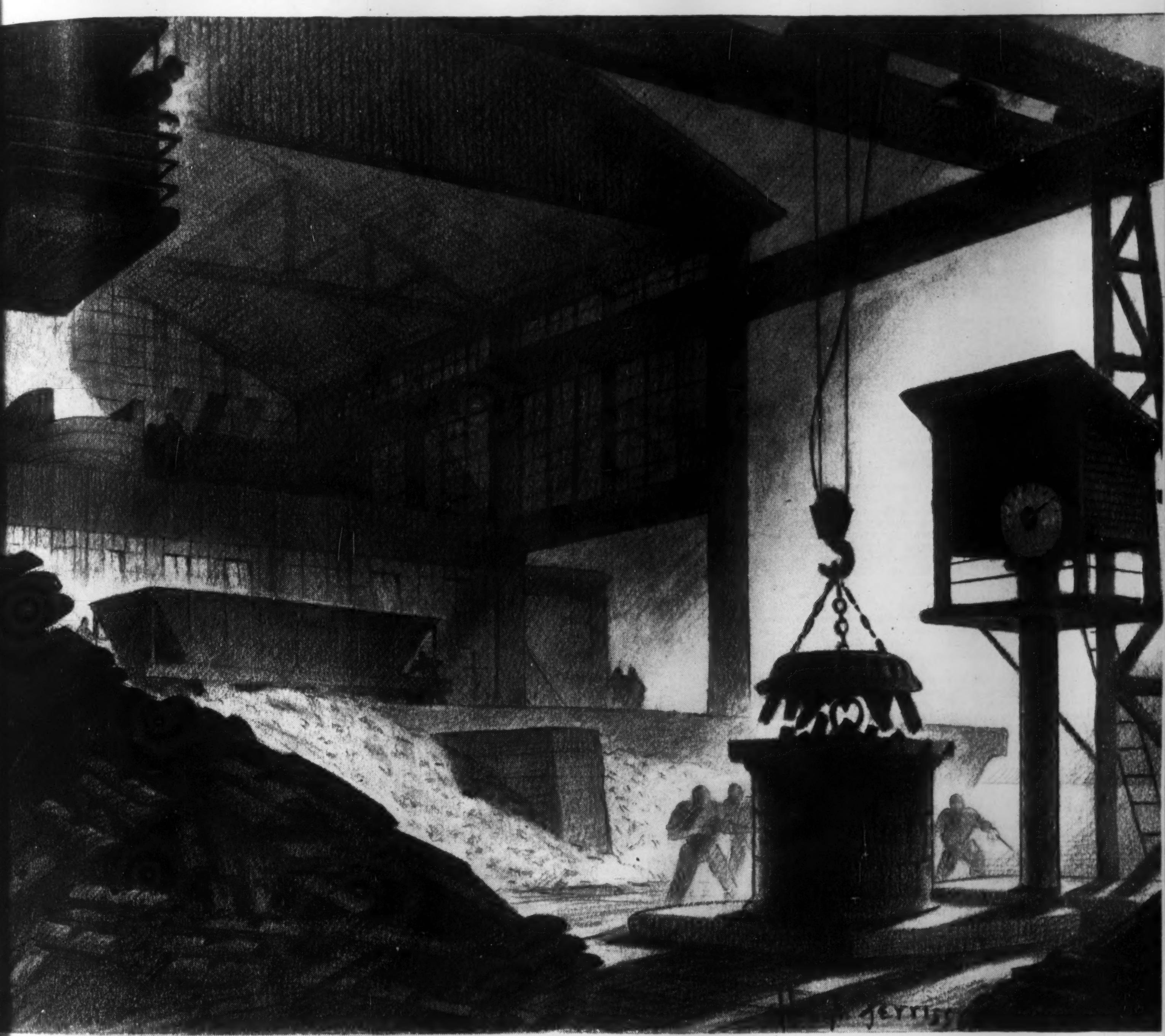

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Instructor or Assistant Professor in Civil Engineering; preferably man qualified to teach work in sanitary field, surveying and one or two courses in structures. Salary, $1,800 for instructor, or $2,500 a year for assistant professor. Location, New England. W-1744.

Instructor in Civil Engineering, to teach surveying, strength of materials, or soil mechanics. Must have been in upper half of class. Salary, $2,600 a year. Location, New York, N.Y. W-1895.

Associate or Assistant Professor of Structural Engineering. Apply by letter giving complete statement of training, experience, and personal data, and include photograph. Salary, $2,900–$3,600 for 9 months' work with prospect of summer employment at extra compensation. Location, South. W-1921.

Concrete Ship Designers. Must have had some experience in this type of work. Salary open. Location, New York, N.Y. W-1964.

Instructor in Civil Engineering, who is qualified to teach junior and senior civil engineering subjects. University now 100% on Army specialized war-training program. Salary, $2,200–$2,400 for calendar year. Location, New England. W-1973.

Development Engineer, graduate civil, preferably 38–45, who has had a good mathematical background and considerable experience on structural design, including both steel and concrete. Must also be capable of attacking new problems in structural-materials development. Permanent. Location, New York, N.Y. W-1978.

Instructor in Civil Engineering Department to teach general civil engineering subjects as well as applied mechanics. Salary, $2,400 for 10 months, plus extra compensation for 2 extra months. Location, Connecticut. W-2124.

Civil or Hydraulic Engineers. Apply by letter giving complete information. Salaries, from $1,200–$3,600 a year. Positions available in various locations in the state of Illinois. W-2162.

Construction Superintendent who has had considerable experience in waterfront construction work. Must be familiar with pier and dock work, stone masonry, pile driving, dredging, etc. Salary open. Location, South. W-2178.

Structures Engineer to be responsible for proper preparation of air-frame stress analyses, check and approve aircraft salvage records, and be responsible for special assignments. Should be graduate of technical college and have specialized in structures and design. Salary, $3,600–$4,800 a year. Location, Pennsylvania. W-2187 (*b*).

Structural Draftsmen for detailing of prefabricated timber work and structural steel. Permanent. Salary, $3,000 a year for a 40-hour week. Location, New Jersey. W-2190.

(*b*) **Assistant Principal Designer and Lead Man** for checking and drafting. Permanent. Salary, about $4,160 a year. Location, northern New Jersey, within commuting distance of New York City. W-2222.

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New books of interest to Civil Engineers donated by the publishers and filed in the Engineering Societies Library, or in the Society's Reading Room, will be found listed here. The notes regarding the books are taken from the books themselves and are edited by members of the staff of the Society or of the Library. Those books which are in the Library may be borrowed by mail by Society members for a small handling charge.

An Introduction to Architectural Drawing. By Wooster Bard Field. McGraw-Hill Book Co., New York and London, 1943. 245 pp., illus., figs., diagrs., $12 \times 8\frac{1}{2}$ in., cloth, $3.

It is the purpose of this attractive volume to explain the graphic methods of representing the elements of a simple building, with the hope that it may be the means of encouraging students to enter the field of architecture. It is emphasized that the early study of architectural drafting is simply a study of the architectural symbols and their proper use in a graphic description of the structure.

Applied Mechanics. By Raymond M. Biehler. Harper and Brothers, New York and London, 1943. 291 pp., diagrs., charts, tables, $9\frac{1}{2} \times 6$ in., cloth, $3.25.

Prepared over a period of several years, this book has been tested in mimeographed form and revised in the light of classroom experience. Its final revision, just before publication, was made with wartime needs in mind. The book is recommended for wartime courses in mechanics for three reasons: (1) It is adapted for brief courses in the subject; (2) it is designed for students with limited mathematical backgrounds; and (3) it stresses the practical applications of the subject.

Cameron Hydraulic Data, 11 ed. Edited by G. V. Shaw and A. W. Loomis. Ingersoll-Rand Co., Cameron Pump Division (11 Broadway), New York, 1942. 233 pp., diagrs., charts, tables, $7\frac{1}{2} \times 4\frac{1}{2}$ in., fabrikoid, $3.

This handbook presents in convenient form a collection of data, largely in tabular form, frequently wanted in dealing with practical problems involving the handling of steam, water, and other liquids.

Dictionary of Science and Technology in English—French—German—Spanish. By M. Newmark. Philosophical Library, 15 East 40th St., New York, 1943. 386 pp., tables, $9\frac{1}{2} \times 6$ in., cloth, $6.

This dictionary contains a list of some 10,000 English scientific and technical terms, with their equivalents in French, German, and Spanish. French, German, and Spanish indexes make it possible to use any of these languages with English. The selection is a good one and includes many recent terms that are absent from older books.

(The) Elements of Aerofoil and Airscrew Theory. By H. Glauert. University Press, Cambridge, England; Macmillan Company, New York, 1943. 228 pp., diagrs., charts, tables, $9 \times 5\frac{1}{2}$ in., cloth, $3.50.

The theory of the aerofoil and the airscrew is presented here in a form suitable for students with no previous knowledge of hydrodynamics, and with a minimum use of complex mathematical analysis. The author first reviews the necessary portions of hydrodynamic theory. Following this, the lift of an aerofoil in two-dimensional motion, the effect of viscosity and its bearing on aerofoil theory are presented, followed by the development of the theory of aerofoils of finite span. The final chapters develop the theory of the airscrew. This edition reproduces the English one published in 1926 and frequently reprinted.

English for Engineers, 4 ed. By S. A. Harbarger, A. B. Whitmer, and R. Price. McGraw-Hill Book Co., New York and London, 1943. 225 pp., $8\frac{1}{2} \times 5\frac{1}{2}$ in., cloth, $1.75.

This well-known guide to the study of English for engineers emphasizes the point of view of previous editions. The aim is to point out the ways in which the student can apply the basic principles of writing to his own activities. Part one of the book provides material for an inventory of the skills used in writing and speaking. Part two illustrates the use of these principles in the writing of letters, reports, professional papers, etc. The new edition has been skillfully revised and greatly improved.

Geomorphology, the Evolution of Landscape. By N. E. A. Hinds. Prentice-Hall, New York, 1943. 894 pp., illus., diagrs., charts, maps, tables, $9\frac{1}{2} \times 6$ in., cloth, $5.

A readable text, with a profusion of excellent illustrations, this book is intended for beginning students and general readers. The nature and evolution of the present relief of the earth's surface are described fully, with a minimum of technical terms.

Meteorology. By L. P. Harrison. National Aeronautics Council, New York (37 West 47th St.), 1942. 314 pp., illus., diagrs., charts, maps, tables, $8\frac{1}{2} \times 5\frac{1}{2}$ in., cloth, $2.

This text provides an elementary course in the subject and covers the field generally, with special attention to the needs of aviators.

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BRIDGES

Highway. Design of Slab and Stringer Highway Bridges, N. M. Newmark and C. P. Siess. *Pub. Roads*, vol. 23, no. 7, Jan.-Mar. 1943, pp. 157–164. Report of investigation conducted by the University of Illinois Engineering Experiment Station, Public Roads Administration, and Illinois Division of Highways; I-beam, composite I-beam, and concrete I-beam bridges discussed; formulas for moments controlling design of slab and stringer bridges are applicable to wide range of sizes and proportions of bridges; procedures described are applicable generally to structures with span lengths from 20 to 80 ft.

Concrete Frame, Ontario. Designing Three-Span Rigid-Frame Concrete Highway Bridge by Methods of Column Analogy and Moment Distribution, L. Loch. *Roads & Bridges*, vol. 81, no. 4, Apr. 1943, pp. 19–24, 81–82, and 84. Design details of bridge in Ontario; design permits of maximum unobstructed vision for users of main highway, this being achieved by crossing main double highway in one span without resort to center pier on separating boulevard.

Construction, United States. Bridge Design and Construction, W. G. Bowman. *Eng. News-Rec.*, vol. 130, no. 6, Feb. 11, 1943, p. 203. Activity in 1942 was at low level, although several notable bridges begun earlier were completed, and small timber and unreinforced masonry structures increased in number and variety.

Culverts, Design. Hydrological Factors in Design of Culverts and Small Bridges, F. W. Grove. *Roads & Bridges*, vol. 81, no. 4, Apr. 1943, pp. 32, 66, and 68. Factors that influence size of culverts and small bridge openings reviewed. Before 29th Annual Purdue Road School, held under auspices of Purdue Univ., Lafayette, Ind.

Highway, Wrecking. Demolition of Modern Highway Bridge, L. C. Fairbank, Jr. *Military Engr.*, vol. 35, no. 207, Jan. 1943, pp. 8–12. During recent Army maneuvers, Engineer Combat Battalion was permitted to demolish concrete piers of recently abandoned steel truss bridge on U.S. Highway No. 1, across Wateree River, 2 miles west of Camden, S.C.; bridge originally consisted of four spans varying from 100 to 180 ft in length, and was, at normal stage of river, 40 ft above water surface; details of demolition procedure given.

Maintenance and Repair. Repairing Damage to Bridges. *Surveyor*, vol. 102, no. 2662, Jan. 29, 1943, pp. 47–48. Details of nature and extent of damage to six bridges in one locality and remedial measures taken; notes on old girder bridge; stone arch bridge; modern bridge; explosions in pipe ducts; minor damage to footbridge.

Military. Improvised Bridge, A. E. Cockerton. *Roy. Engrs. J.*, vol. 56, Dec. 1942, pp. 28–35, supp. sheet. Description of two-pinned arch rib bridge of 47-ft 6-in. span, constructed and erected by two sub-sections of Field Company as training exercise in improvised bridging; time taken was 18 hours.

Natural Gas Pipe Lines. World's longest Pipe Line Suspension Bridge, D. B. Boydston. *Oil Weekly* vol. 109, no. 5, Apr. 5, 1943, pp .88, 90, and 92. Construction details of bridge on line of Oklahoma Natural Gas Co., across South Canadian River, described by G. R. Lunt in paper previously indexed from *Petroleum Eng.*, March 1943.

Plate Girder, Australia. Story Bridge, Brisbane, Queensland. *Engineering*, vol. 155, Nos. 4016 and 4017, Jan. 1, 1943, pp. 1–4, and Jan. 15, pp. 41–43. Illustrated description of planning and construction of cantilever bridge with 60-ft roadway and two 10-ft footways on cantilevered ends of cross girders.

Plate Girder, Hartford, Conn. Long Plate Girders in Hartford Bridge, C. H. Gronquist. *Eng. News-Rec.*, vol. 130, no. 10, Mar. 11, 1943, pp. 344–347. Silicon steel-plate girders, 17 ft deep over piers, and $11\frac{1}{2}$ ft elsewhere, are used for continuous spans of 270 ft, 300 ft, and 270 ft on Hartford, Conn., bridge; continuous girders are also employed for east approach, 500 ft of which lies on one-degree horizontal curve.

Plate Girder, Hartford, Conn. Plate-Girder Erection at Hartford, R. N. Boynton. *Eng. News-Rec.*, vol. 130, no. 12, Mar. 25, 1943, pp. 443–446. Report on construction methods used for erection of three-span, 840-ft continuous plate girder, which includes longest girder span in United States; piles for falsework bent foundations were driven through heavy steel bracing cages; grid deck was filled with concrete by paver serviced by batch trucks operating directly on grid.

Railroad. Beams of Glued 1-In. Boards Carry Railroad Line to War Project. *Eng. News-Rec.*, vol. 130, no. 8, Feb. 25, 1943, p. 287. Pile trestle with caps and stringers of 1-in. boards laid flat and glued together is carrying locomotives and cars on war project access line; cap timbers are 12 in. wide by 14 in. deep, and stringers are 9 × 20 in., 30 ft long, spanning 15-ft center-to-center of bents; 3 stringers are used under each rail with 2-in. open space between.

Railroad Tracks, Fastenings. Rail Fastenings on Bridges, *Wood Preserving News*, vol. 21, no. 2, Feb. 1943, pp. 18–23. Report developed chiefly from information obtained by means of questionnaire, replies being received from railroads aggregating 135,000 miles of lines; bridge ties; preframing; fastening ties to stringers; tie plates; conclusions.

Replacement. Problem of Outworn Bridge, W. H. Keith. *Roads & Bridges*, vol. 81, no. 3, Mar. 1943, pp. 72 and 74. Comprehensive plan of bridge replacement is urged as postwar project. Before Ontario Good Roads Assn.

Steel, Design. Re-design of Quebec Bridge. *Roads & Bridges*, vol. 81, no. 2, Feb. 1943, pp. 17–22, and 48. Plans, presented by C. P. Disney for re-design of single-span cantilever bridge, illustrate how steel can be conserved for wartime requirements; results of study show that structure of equal traffic capacity and navigation clearances could be built today with only 6,650 tons of steel.

Steel, Painting. Bridge Paint Maintenance, T. H. Dennis. *Eng. News-Rec.*, vol. 130, no. 10, Mar. 11, 1943, pp. 368–372. Details of department of specialists of Calif. Div. of Highways, whose job it is to renew and maintain paint on bridges of state highway system; description of working methods and equipment used.

Steel Truss, Dubuque, Iowa. Three-Span Continuous Truss Bridge with Middle Span Tied Arch. *Eng. News-Rec.*, vol. 130, no. 8, Feb. 25, 1943, pp. 282–287. Central portion of new Mississippi River bridge is 3-span continuous truss with 845-ft middle span built as cantilever and made tied arch by addition of bottom chord tie members; at end piers, rocker columns 8 ft long are employed; at both ends of arch usual expansion shoes riding on nested rollers are provided under each truss, and at east end of arch large pin embedded at center of pier extends upward into floor beam to carry longitudinal wind load without producing torque in pier.

Suspension. Theory of Suspension Bridges, S. P. Timoshenko. *Franklin Inst.—J.*, vol. 235, nos. 3 and 4, Mar. 1943, pp. 213–238, and Apr., pp. 327–349. Various methods of analysis of suspension bridges are discussed, together with their application to several particular bridges; cases of perfectly flexible cable and of unstiffened suspension bridge and equations for calculation of deflections and changes in cable tension produced by live load are developed.

Suspension, Cable Removal. Unspinning Tacoma Narrows Bridge Cables, C. E. Andres. *Eng. News-Rec.*, vol. 130, no. 2, Jan. 14, 1943, pp. 35–37. Equipment, designed with little precedent and assembled without aid of priorities, is unspinning main cables of Tacoma-Narrows Bridge 24 at a time; rate that brings total weight of wire removed to 100 tons per 8 hours; wrapping wire was first removed on revolving drum that encircled and traversed main cables.

Wooden. Army Builds Creosoted Timber Bridges. *Wood Preserving News*, vol. 21, no. 4, Apr. 1943, pp. 37–40 and 48. Fifteen creosoted timber highway bridges constructed in large southern Army cantonment; preframed all timber trusses 60 ft long were used for channel spans where wider unrestricted waterways were desirable; standard timber trestles used for approach and other short spans; all bridges have 24-ft clear vehicular roadway and are designed for standard H-15 truck train loading; those in areas of heavy pedestrian traffic have 8-ft sidewalk on either side.

Wooden, New Hampshire. Pre-Framed Timber Bridges in New Hampshire, H. E. Langley. *Roads & Streets*, vol. 86, no. 4, Apr. 1943, pp. 44–46. New Hampshire State Highway Department during winter of 1941–1942 developed plans for two stone-arch bridges and several wooden superstructures for spans varying in length from 20 to 65 ft; for timber spans under 30 ft simple stringer types were used, and for spans 30 ft and over, deck or through pony trusses; all designs provided for 24-ft clear roadway and live load capacity of H-15; fabrication and erection methods; costs.

BUILDINGS

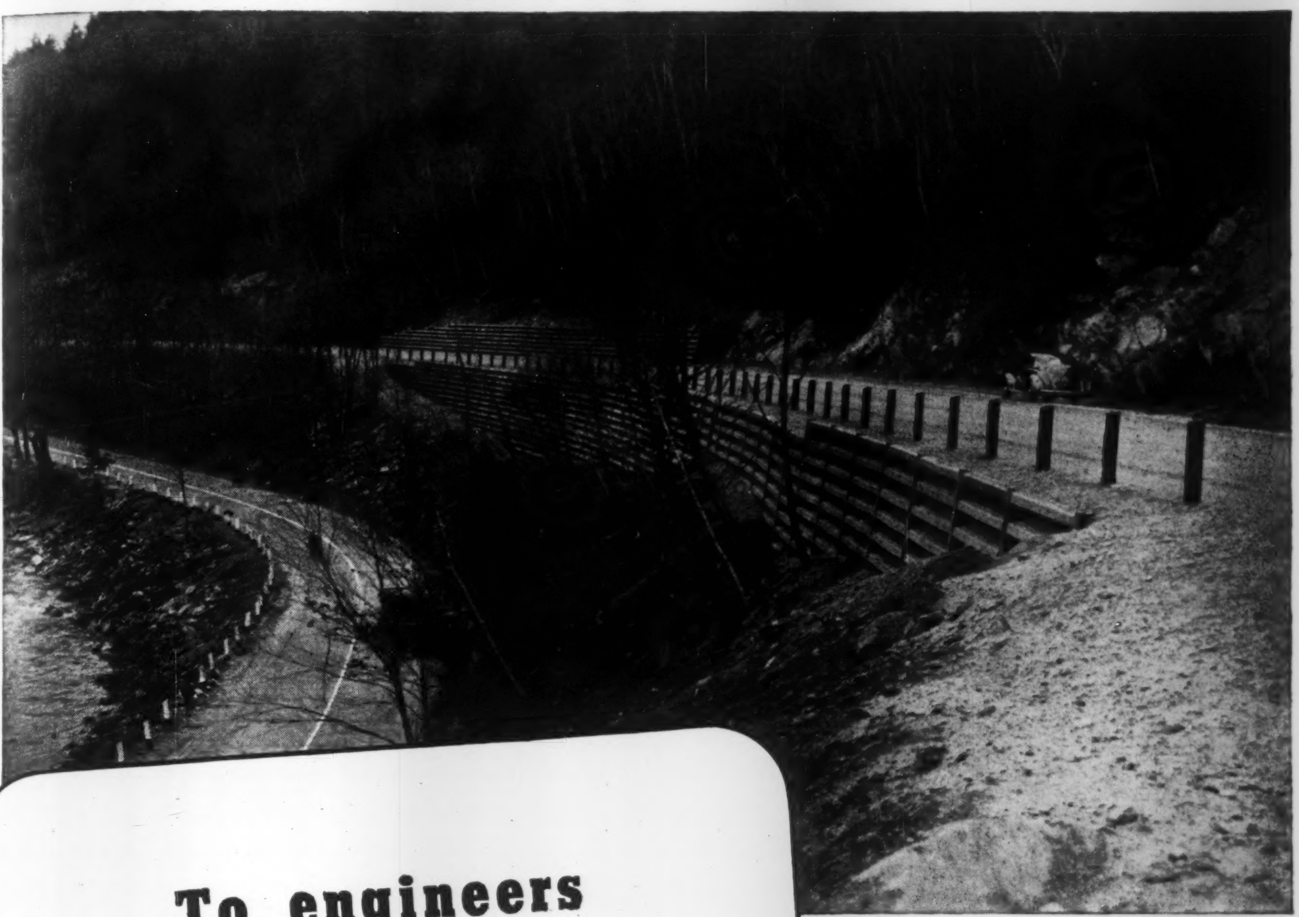
Government Buildings. Access to World's Largest Building. *Eng. News-Rec.*, vol. 130, no. 12, Mar. 25, 1943, pp. 420–424. War Department's huge new Pentagon Building in Arlington, Va., requires extensive highway network to handle traffic flow caused by daily movement of 40,000 employees; providing such roads requires construction of three express arteries together with traffic interchanges and terminal facilities; total of 24 grade separations and pavement equivalent to about 49 miles of 24-ft roadway are being built.

Housing Standards. Standards for Defense Housing. Federal Public Housing Authority, Federal Works Agency Project No. 9781, Mar. 1942, 12 sections paged separately, figs., charts, diagrs. Standards issued as guide to design of Defense Housing Projects; covers complete information on general policies, site selection, survey requirements, site planning, site engineering, lawns and planting, dwelling design, community facilities, structural design, plumbing, heating, electrical work.

Review for 1942. Buildings of 1942 Were for War, A. N. Carter. *Eng. News-Rec.*, vol. 130, no. 6, Feb. 11, 1943, pp. 186–189. Review of accomplishments and material situation in building construction; industrial plant construction, military buildings other than housing, and some commercial structures are reviewed; new designs, materials, and substitutes discussed.

Skating Rinks. Welded Double Steel Skating Floor, H. Vetter. *Western Construction News*, vol. 18, no. 2, Feb. 1943, pp. 65–66. Continuous steel plate floor 90 × 224 ft has freedom of movement, under wide temperature changes, by bolt connections to supporting beams allowing limited horizontal but no vertical movement; brine is distributed through flumes supported on rollers to facilitate floor movement.

Wind Stresses. Report on Wooden Structures to Resist Hurricane Loads. MacKenzie, Sanborn & Bogert, Architects & Engineers, New York, N.Y., Jan. 21, 1943, 44 pp., illus., charts, figs. Report on safeguarding standard Army barracks and other wooden structures against high winds; study covered investigation of practice as to windbracing in Gulf States and West Indies, and examination of engineering and meteorological literature which was readily attainable, relative to frequency, wind velocity, and damage from hurricanes.



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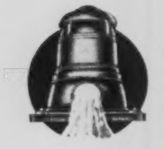

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CITY AND REGIONAL PLANNING

GREAT BRITAIN. Town Planning and Road Safety, G. S. Barry. *Surveyor*, vol. 102, no. 2658, Jan. 1, 1943, pp. 3–4. Consideration of town planning and road networks from point of view of highway accident prevention; replanning existing towns and suggested improvements in layout of by-pass, service, and access roads, as well as road crossings and junctions. Before Ayrshire Council for Accident Prevention.

INDUSTRIAL PROBLEMS. Future of Industrial Towns, F. J. Osborn. *Surveyor*, vol. 102, no. 2668, Mar. 12, 1943, pp. 113–115. Factors which must be considered in future town planning; suburbs and transport development; problems facing planning authorities; pros and cons of apartment developments; housing standards and finance.

MISCELLANEOUS COMMENTS. Planning, W. S. Cameron. *Roads & Streets*, vol. 21, no. 241, Jan. 1, 1943, pp. 9–12. Training of planners; planning and municipal engineer; road design; traffic roundabouts; bridge design; absence of architectural control. Extracts from presidential address before Town Planning Inst.

MUNICIPAL INTERESTS. Municipal Control of Streets for New Developments, F. E. Harley. *Pub. Works*, vol. 74, no. 4, Apr. 1943, pp. 26 and 28–29. Municipality should protect itself by securing properly designed layout, with wide streets, zoning of buildings, including lot areas and setback, adequate drainage, and sewerage.

NEW MEXICO AND TEXAS. Regional Planning. Part X—Pecos River Joint Investigation in Pecos River Basin in New Mexico and Texas. *Nat. Resources Planning Board—Report, pt. 10*, June 1942, 207 pp., map in pocket. Summary, analysis, and findings concerning water supply, irrigation development, salinity, water uses and requirements, floods, erosion, sedimentation, availability and use of water, stream flow records.

POST-WAR. Pittsburgh's Post-War Program, W. H. Buente. *Am. City*, vol. 58, no. 3, Mar. 1943, pp. 42–43. Program of public works for post-war construction; satisfactory administrative process has been secured by which each bureau and department can and will submit its program to make up total long-range city program that can then be put in sequential order for construction in any given post-war year, in relation to need of specific project and city's ability to pay for it; steps in program; major projects.

POST-WAR. Needed: Post-War Planning for West, R. L. Nicholson. *Western Construction News*, vol. 18, no. 1, Jan. 1943, pp. 3–8. Comprehensive outline of program for post-war planning; discussion of resources, power, employment, highway systems, population trends, and construction projects.

POST-WAR. Municipal Planning and Reconstruction. *Engineering*, vol. 155, no. 4017, Jan. 8, 1943, p. 32. Review of scheme drafted in broad outline, by Institution of Municipal and County Engineers, and contained in memorandum on Post-War Planning and Reconstruction, presented by Institution to Lord Portal, Minister of Works and Planning.

POST-WAR. Status of Planning for Post-War Urban Redevelopment, C. T. Stewart. *Planning & Civic Comment*, vol. 8, no. 4, Oct. 1942, pp. 1–7. Basic problems of urban redevelopment; proposed solutions; development of planning now being done to implement major city rebuilding program will follow growing trend of close Federal-local relations; improved building materials and methods for urban redevelopment; Congressional interest in post-war planning; local activity.

POST-WAR. Post-War Planning—Motorways—Freeways Solve Two Problems, L. Atkinson. *Western Construction News*, vol. 18, no. 1, Jan. 1943, pp. 20–23. Author states that motorway development and economic solution of post-war employment problems must be recognized as national problem deserving nationwide support; possibilities of private and public construction; what steps can be taken to solve problems.

POST-WAR, PRACTICAL CONSIDERATIONS. Post-War Planning—Procedure—Practical Considerations, A. H. Adams. *Western Construction News*, vol. 18, no. 1, Jan. 1943, pp. 11–12. Chief Engineer of Los Angeles County Regional Planning Commission discusses "Master Plan," which should be used as plan of transition from war to peacetime economy; plan of highways and airports already prepared in California.

CONCRETE

AGGREGATES, CALIFORNIA. How California Rock and Gravel Co. Cleans Aggregates, Soils, Red Clay and Promotes Efficiency, W. L. Netherby. *Rock Products*, vol. 46, no. 3, Mar. 1943, pp. 52–54, and 70. Plant and facilities are located between Livermore and Pleasanton, Calif.; company produces six classes of coarse aggregates and two of sand; red clay reclaimed from waste water is sold to refractory plants.

AGGREGATES, HANDLING. Army Can't Wait. A. Lindley. *Rock Products*, vol. 46, no. 3, Mar. 1943, pp. 56–57 and 68. Note on installation by Henry J. Kaiser Co. at Army cantonment in Northern California; concrete batching plant set up with long conveyors designed to reduce rail and truck haulage.

CONSTRUCTION. Concrete Surface Finishes. *Concrete & Constr. Eng.*, vol. 38, no. 1, Jan. 1943, pp. 3–13. Illustrated description of use of concrete, uncovered by another material, for facades of structures with architectural pretensions; answers to problems have been found in carefully proportioned concrete mixes, in more supervision of placing and consolidation of concrete, and in paying great attention to design and construction of shuttering.

CONSTRUCTION. Semicircular Arched Conduit with Uniform Symmetrical Loading, S. U. Benscoter. *Am. Concrete Inst.—J.*, vol. 14, no. 4, Feb. 1943, pp. 297–306. Conduit with semicircular arched frame and horizontal base slab may be analyzed according to elastic theory by performing moment-distribution computation at one corner; to this end formulas and graphs for fixed-end shear, fixed-end moment, and stiffness values are presented.

CONSTRUCTION. Variation of Moment of Inertia and Radius of Gyration with Modular Ratio, J. S. Berry. *Concrete & Constr. Eng.*, vol. 38, no. 1, Jan. 1943, pp. 14–15. Curves given facilitate calculation of moment of inertia and radius of gyration for all normal values of modular ratio and steel ratio "r."

CONSTRUCTION, BOMBING EFFECT. Resistance of Concrete Structures to Air Attack, J. B. Wells. *Architect & Engr.*, vol. 152, no. 2, Feb. 1943, pp. 27–31. Effects of bombing in reinforced concrete structures and designs best suited to resist attack; force of atmospheric blast and suction set up by explosion and force of impact of flying fragments discussed; monolithic concrete construction of newer design has withstood tremendous bombing stress; vulnerability of exterior columns; types of slab construction.

CULVERTS. Unreinforced Concrete Culvert Design Adapted to Build Airfield Storm Sewer. *Eng. & Contract, Rec.*, vol. 56, no. 8, Feb. 24, 1943, pp. 60–61. Development, illustrating wartime trend to adaptation of existing designs for saving of critical materials, reported by Portland Cement Assn.; standard design for unreinforced concrete culverts of Tennessee Dept. of Highways and Public Works was adapted to construction of 2,500-ft-long storm sewer that drains airfield at U.S. Naval Reserve aviation base being built in that state.

CURING. Wartime Restrictions Affect Curing Methods for Concrete Roads. *Roads & Bridges*, vol. 81, no. 2, Feb. 1943, pp. 26–27, 64, 66, and 68–71. Details of recommended practice for curing portland cement concrete pavements under wartime restrictions on critical materials given; practice covers materials and methods for curing pavements through application of wet coverings, initial water spray, liquid membrane seal coats, or waterproof paper.

DESIGN. Balanced Design for Reinforced Concrete, A. J. Boase and C. E. Morgan. *Am., Concrete Inst.—J.*, vol. 14, no. 4, Feb. 1943, pp. 277–296. Authors question practice of uniform factor of safety on dead and live load and suggest method of design which they believe would permit better distribution of reinforcing steel than could be obtained by flat increase in working stresses, and at same time reduce required amount of reinforcing steel without reduction in factor of safety.

INDUSTRIAL PLANTS. Industrial Buildings of Pre-Cast Concrete. *Eng. News-Rec.*, vol. 130, no. 8, Feb. 25, 1943, pp. 302–305. Description of industrial buildings, now under construction, with all members of pre-cast reinforced concrete; columns, girders, beams, wall panels, and floor and roof slabs are cast at central yard and delivered to job ready for assembly; shapes that require few forms have been developed, and all connections for framing have been standardized.

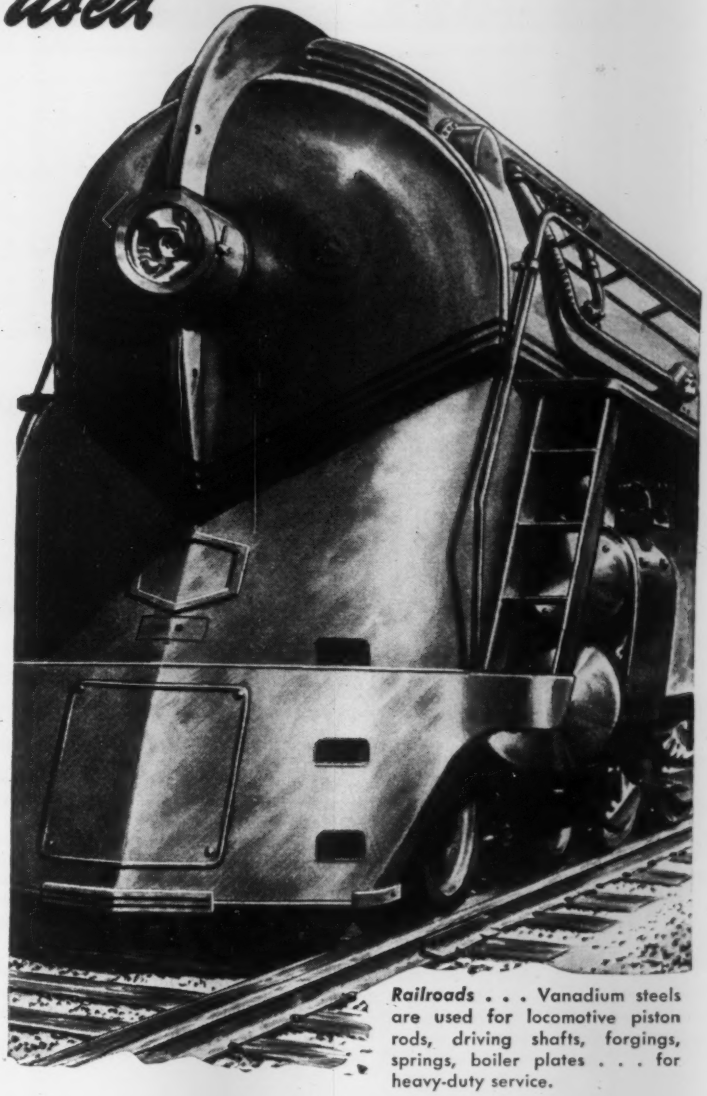
OIL WELL CEMENTING. Multiple Batch Squeeze Cementing, S. P. King. *Petroleum Engr.*, vol. 14, no. 6, Mar. 1943, pp. 74 and 76. Suggested technique, based on experience in foreign fields, where native labor and lack of modern cementing equipment and trained personnel augment responsibility of petroleum engineer on job; procedure; calculations.

ROADS AND STREETS. Concrete Pavements in Wartime, D. O. Robinson. *Roads & Bridges*, vol. 81, no. 4, Apr. 1943, pp. 25–27 and 78. Review of Canadian practice in airport runway, highway, and industrial paving construction.

ROOFS. Long Span Concrete Roof Construction, C. H. Mayer. *Am. Concrete Inst.—J.*, vol. 14, no. 5, Apr. 1943, pp. 389–396. Reinforced concrete roof design used by author during last 25 years for economy and speed, is of special interest in its minimum use of critical materials in these times; notable feature of design is simple Howe truss whose top chord members support continuous monitor for light and ventilation.

ROOFS. Multiple-Arch Concrete Roof Saves Steel. *Eng. News-Rec.*, vol. 130, no. 2, Jan. 14, 1943, pp. 31–34. Design of war plant was changed from structural steel to concrete frame and multiple-arch thin-slab concrete roof when

Why Vanadium is used in ENGINEERING STEELS



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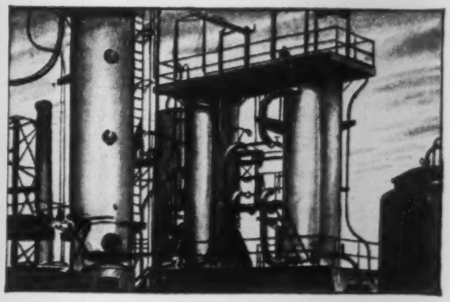

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steel was banned for such projects; adopted design requires only 2.7 lb of steel per sq ft of floor area.

SHIPS. Concrete Ships of 1943, G. C. Manning. *Naut. Gaz.*, vol. 133, no. 4, Apr. 1943, pp. 20–23. Up to present, concrete ships have been unable to compete with steel ships because of their greater hull weight; what is being done in concrete shipyards to reduce hull weight, initial cost, and time of construction; yard layout; steel and plywood forms; reinforcing steel; spiral type steel reinforcement; new light-weight aggregate.

SUPPORTS. Uses of Concrete Underground: With Special Reference to Concrete Props, L. C. Maitland. *Colliery Guardian*, vol. 166, no. 4280, Jan. 8, 1943, pp. 36–40. General information on manufacture and reinforcement of concrete; some of uses to which it can be applied; results obtained at several collieries. Before North of England Inst. of Min. and Mech. Engrs.

CONSTRUCTION INDUSTRY

WAR PRACTICES. Notable Practices on War Construction, H. W. Hunt. *Eng. News-Rec.*, vol. 130, no. 6, Feb. 11, 1943, pp. 204–206. Use of alternative materials and rebuilt machines enabled constructors to meet war's limitations; structures and forms planned simultaneously have simplified and speeded concrete construction; problem of materials; marine structures; structures for war; pipelines from Texas; new machines.

DAMS

CONCRETE ARCH, BRITISH COLUMBIA. Design and Construction of Scanlon Dam, B.C., W. Jamieson. *Eng. J.*, vol. 26, no. 1, Jan. 1943, pp. 4–9. Construction details of dam recently built to supply additional power to large paper and pulp manufacturing plant of Powell River Co., at Powell River; brief reference made to hydroelectric developments of which it forms part, and circumstances leading to its present construction. Before Eng. Inst. Canada.

EARTH, COLORADO. Construction of Milton Seaman Dam by Greeley, Colo., R. E. Seaman and C. G. Klein. *Pub. Works*, vol. 74, no. 3, Mar. 1943, pp. 24 and 26. Building of earth dam in remote canyon delayed and cost increased by difficulties in obtaining labor and overcoming priority restrictions.

EARTH, OKLAHOMA. Great Salt Plains Dam, M. W. DeGeer. *Military Engr.*, vol. 35, no. 208, Feb. 1943, pp. 80–82. Great Salt Plains Dam is located on Salt Fork of Arkansas River about 2¹/₂ miles southeast of community of Vining, in Alfalfa County, Oklahoma; dam is of rolled earth-fill type, with crest of elevation 1,168.5, is about 5,700 ft long, and rises to maximum height of 68.5 ft above valley floor.

RESERVOIRS, LEAKAGE. Action of Bentonite Clay in Stopping Leaks in Water-Supply Reservoirs. *Water & Sewage*, vol. 81, no. 2, Feb. 1943, pp. 14–15. When bentonite clay is poured into water it swells rapidly forming smooth, creamy paste, or gel; for treating ponds, lakes, canals, earth dams, and reservoirs bentonite is used in dry form; description of sprinkle method; plugging broken mains.

WOODEN. Creosoted Wood Dam for Water Supply. *Wood Preserving News*, vol. 21, no. 4, Apr. 1943, pp. 45–47. Dam composed of creosoted lumber and piles was installed as part of water supply system for project recently completed in southern state; constructional details given.

FLOOD CONTROL

FLOODS, OREGON. Willamette Floods in Oregon. *Western Construction News*, vol. 18, no. 2, Feb. 1943, pp.67–68. Nearly double rainfall during December raised Willamette River to 20-year high causing estimated $5,000,000 in damage; debris damaged timber pile trestle; two dams washed out; Fern Ridge and Cottage Grove dams retarded some flow.

HARTFORD, CONN. Hartford Flood Protection, H. S. Bishop, Jr. *Military Engr.*, vol. 35, no. 207, Jan. 1943, pp. 35–39. General plan for city includes dike encircling North Meadows area, intermittent dike and concrete wall along more highly developed river-front section, and dike encircling South Meadows area, in which Brainard Field is located; construction of dike; Park River conduit; pumping stations; municipal improvements.

UNITED STATES. Post-War Planning—Flood Control—Army Investigating New Work. *Western Construction News*, vol. 18, no. 1, Jan. 1943, pp. 9–10. Ultimate possibilites in development of multiple-purpose river control; general comprehensive plans involving reservoirs, levees, channel improvements, and allied works have been approved and initiated for nine of major river basins of United States; these are awaiting appropriations or are ready for post-war consideration.

FOUNDATIONS

MARKET BUILDINGS. Brooklyn Terminal Market Founded on Creosoted Piles, R. H. Mann. *Wood Preserving News*, vol. 21, no. 2, Feb. 1943, pp. 13–15. Brief description of market which is built upon filled ground and founded upon creosoted foundation piles, with cut-off elevation well above water table; it will comprise 12 steel framed structures, freight yard with essential sidings, and 6 open sheds to provide space for 240 trucks.

PILES, STEEL. Fixing Conditions of Anchored Sheet Piling, H. G. Schutte. *Civ. Eng.* (London), vol. 38, no. 439, Jan. 1943, p. 20. Distribution of earth pressure to be assumed in design of sheet piling is investigated theoretically with reference to views of Engels, Franzius, and Blum, and method of computation examined in number of practical cases. Brief English abstract of paper in *Bauingenieur*, vol. 22, no. 19/20, 1941, pp. 193–197.

SOIL SURVEYS. Preliminary Survey for Foundations, R. R. Minikin. *Civ. Eng.* (London), vol. 38, no. 439, Jan. 1943, pp. 10–12. Pre-examination of strata by underwater test pits; method of sinking test pit; core extraction; typical rotary hand and power drilling machines.

WOODEN. Method of Recording and Evaluating Test Pile Data, J. B. Broach. *Wood Preserving News*, vol. 21, no. 4, Apr. 1943, pp. 41–43. Article sets forth some of prerequisites, practices, and methods found to be useful in this type of work.

HYDROLOGY AND METEOROLOGY

BEACHES, WAVE EFFECT. Waves as Sand-Transporting Agent, U. S. Grant. *Am. J. Sci.*, vol. 241, no. 2, Feb. 1943, pp. 117–123. Studies of fluctuations in amount of sand on beaches and adjacent shallow sea floors of Southern California, together with variations in wave size and type, prove direct relationship exists between these phenomena; theoretical studies of oscillatory waves prove existence of mass transport of water, and field and laboratory investigations confirm water movement; explanation given accounts for fluctuation in amount of sand on beach and variation in grain size.

EVAPORATION. Evaporation From Lakes and Reservoirs, A. F. Meyer. Minn. Resources Commission, St. Paul, Minn. June 1942, 112 pp., supp. maps and graphs. Monthly and annual evaporation from lakes and reservoirs in United States, as determined by study based on 50 years of Weather Bureau records, are presented in form of maps, graphs, tables, for convenient use in design, construction, operation, and main-

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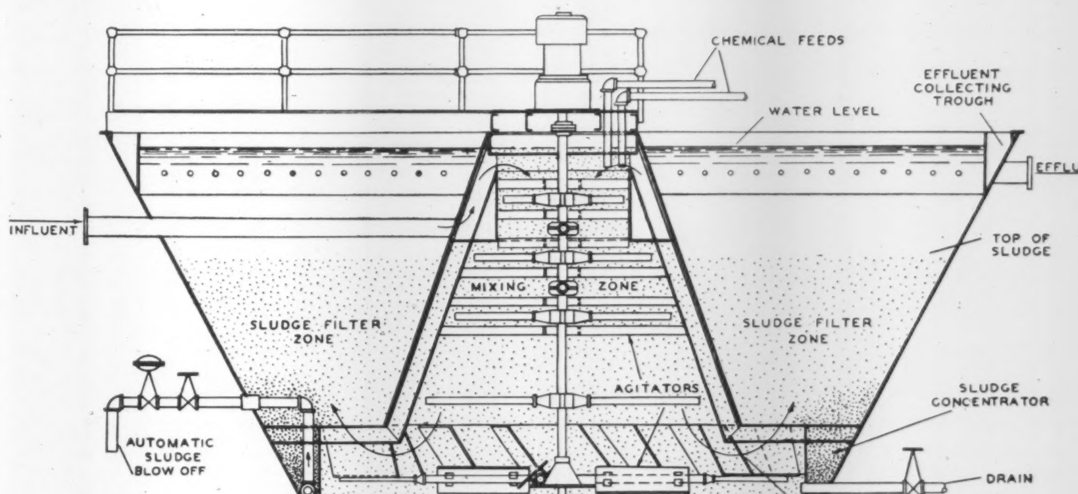
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INLAND WATERWAYS

Rivers, Silt. High Silt Content of Colorado River. *Eng. News-Rec.*, vol. 130, no. 14, Apr. 8, 1943, pp. 502–503. Records of annual runoff and load of suspended matter in Colorado River and its tributaries, summarized recently by U.S. Geological Survey, show enormous amount of solids carried in suspension by river, but do not appear to indicate definite relation of runoff to solid content.

IRRIGATION

Post-War. Post-War Planning—Irrigation—Reclamation Investigations. *Western Construction News*, vol. 18, no. 1, Jan. 1943, pp. 13–19. Work can be resumed immediately on 25 Bureau of Reclamation projects in 14 states and on 5 new projects which have been authorized; more than 200 projects in 17 states are under investigation, and 60 of these will be completed in 1943.

United States. More Production from Improved Irrigation Practices, H. Matson. *Agric. Eng.*, vol. 24, no. 4, Apr. 1943, pp. 119–120 and and 122. Agricultural production must be increased to meet our expanded needs and those of our allies during and following war emergency; much can be done to increase production by improvement of existing irrigation systems and use of better irrigation practices; examples cited. Before Am. Soc. Agric. Engrs.

LAND RECLAMATION AND DRAINAGE

Airports. Underground Channels Utilized for Airport Drainage. *Eng. News-Rec.*, vol. 130, no. 14, Apr. 8, 1943, pp. 498–499. Drainage from 265-acre airport in Midwest is by disposal of runoff into cavernous limestone underlying site; churn drill was used to cut through 10 to 20 ft of rock to caverns below, and concrete pipe manholes were constructed to serve as intakes; most of runoff is handled by finished grades sloping toward manholes, but some French drains paralleling runways and discharging into manholes also were required.

MATERIALS TESTING

Beams and Girders, Concrete. Fatigue Tests of Light Weight Aggregate Concrete Beams, H. A. Williams. *Am. Concrete Inst.—J.*, vol. 14, no. 5, Apr. 1943, pp. 441–447. Results of limited number of reversed and repeated loading tests of unreinforced concrete beams made with Haydite and Gravelite light-weight aggregates are presented.

Concrete. Computation of "Synamic Modulus," S. Walker. *Am. Soc. Testing Matls.—Bul. No. 121*, Mar. 1943, pp. 23–24. Modulus of elasticity as determined from measurements of fundamental frequencies of test specimens is useful in investigations of concrete; formula reported by Obert and Duvall, based on solutions by Timoshenko and Goens for specimens vibrating in flexure in free-free mode, is given, thus affording accepted basis for computations.

Concrete. Some Long Time Tests of Concrete, M. O. Withey and K. F. Wendt. *Am. Concrete Inst.—J.*, vol. 14, no. 4, Feb. 1943, pp. 221–238. Results of strength and expansion of tests on three series of concrete specimens begun in 1910, in 1923, and in 1937; most of specimens have been cured outdoors, some have been cured under water and others in laboratory; variables in types of cement, types of coarse aggregate, consistency, and methods of placement are included in experiments.

PORTS AND MARITIME STRUCTURES

Wooden, Preservation. Mortar-Coated Piles Resist Hard Treatment. *Eng. News-Rec.*, vol. 130, no. 12, Mar. 25, 1943, pp. 425–427. Report on experience with some 2,500 untreated wood piles coated with shotcrete which demonstrates that jackets have great resistance to rough handling and give piles rigidity and durability.

PUBLIC WORKS ENGINEERING

Review of 1942 Works. Municipal Affairs and Sanitation Activities, E. J. Cleary. *Eng. News-Rec.*, vol. 130, no. 6, Feb. 11, 1943, pp. 190–193. Review of municipal affairs and public works during 1942, with special emphasis on sewage treatment, water supply, and refuse disposal practice.

ROADS AND STREETS

Airport. Speed in Spite of 86 Rainy Days. *Roads & Streets*, vol. 86, no. 3, Mar. 1943, pp. 37–43. Account of centrally located airport job completed in 1942, which is notable for construction progress in spite of frequent rains, and for difficult subgrade conditions corrected under intensive soils laboratory guidance; California method of designing flexible pavements used; field is designed to serve army technical training school; layout includes four 150-ft runways 5,260 to 5,640 ft in length, built to carry medium planes, plus several 50-ft taxiways and 400-ft apron.

Airport Runways. Test Runway Gives Data on Base Thickness Requirements. *Eng. News-Rec.*, vol. 130, no. 12, Mar. 25, 1943, pp. 430–433. Thickness of base needed under 3-in. asphaltic pavement subjected to typical airport runway service, including vibration and impact of planes warming up and landing, was subject of investigations at California airfield, where gravel base thicknesses up to 45 in. were tested to destruction; conclusions give thickness needed for wheel loads up to 54,000 lb.

SEWERAGE AND SEWAGE DISPOSAL

Aeration. Contact Aeration for Sewage Treatment, L. B. Griffith. *Eng. News-Rec.*, vol. 130, no. 4, Jan. 28, 1943, pp. 138–142. Processing units and flow diagram for Hays submerged contact aeration-type sewage-treatment plant; outline of latest design practice and operating experiences.

Camps, Military. High-Degree Treatment for Camp Sewage, H. F. Porter. *Eng. News-Rec.*, vol. 130, no. 2, Jan. 14, 1943, pp. 38–42. Two-stage bio-filtration process used at army camp in sewage plant to provide highly purified effluent coupled with flexibility to meet varying load conditions; plywood V-notch weirs used to save critical materials.

Disposal Plants, Cleveland, Ohio. Operating Easterly, J. J. Wirts. *Am. City*, vol. 58, no. 3, Mar. 1943, pp. 37–38. Easterly sewage treatment plant at Cleveland uses activated sludge process; article presents some significant monthly average measurements for 1941; data indicate how plant operates, what it does, and what results it produces.

Industrial Wastes. Chromium—Water and Sewage Problems, D. W. Graham. *Am. Water Works Assn.—J.*, vol. 35, no. 2, Feb. 1943, pp. 159–164. Presence of chromium in industrial wastes, particularly from numerous airplane plants, in Southern California has caused pollution of Los Angeles River and its underground water supply due to improper disposal methods; outline is given of methods used for chromium analysis in sewage and potable water. Bibliography.

Industrial Waste. Waste Disposal Problems in Wartime, F. W. Mohlman. *Chem. & Met. Eng.*, vol. 50, nos. 1 and 2, Jan. 1943, pp. 78–81, and Feb., pp. 127–131. Problems involved in wartime disposal of both domestic sewage and industrial wastes; chief emphasis is placed on sewage and by-product recovery; wastes from chemical process industries, including munition plants.

Pipe, Vitrified Clay. Biggest Sewer Pipe in World, F. W. Fernholtz. *Brick & Clay Rec.*, vol. 102, no. 2, Feb. 1943, pp. 12–17. Pacific Clay Products Co., Los Angeles, meets high California sewer-pipe standards by blending three different clays in making world's largest sewer pipe; firing is at cones 4–8.

Public Institutions. Sewage Treatment for Public Institutions, R. C. Wheeler. *Pub. Works*, vol. 74, no. 2, Feb. 1943, pp. 17–18 and 42. Typical plants for state institutions in New York State, including leaching cesspools preceded by Imhoff or septic tanks.

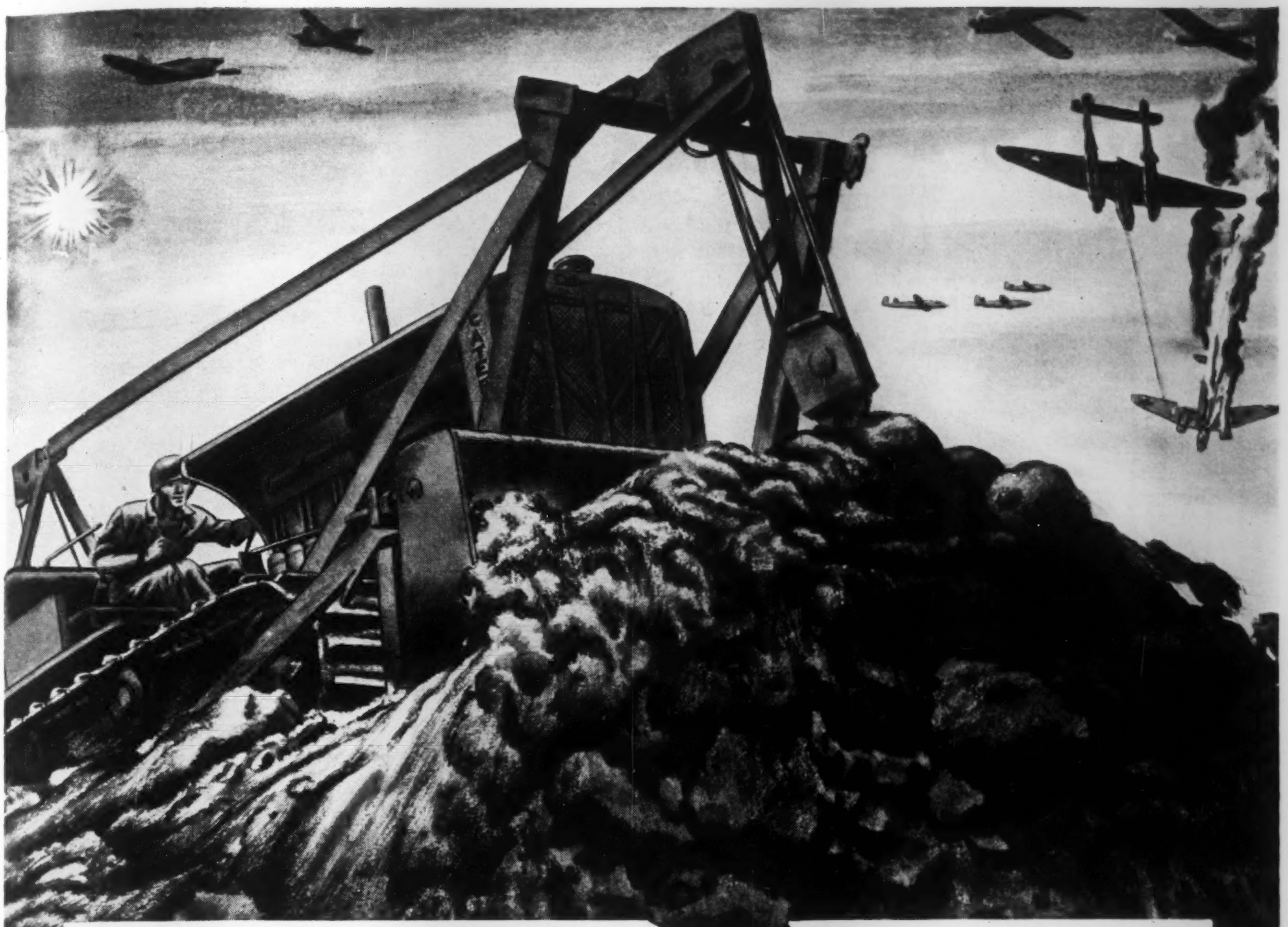
Purification. Purification of Strong Sewage by Re-Circulation Through Percolating Filter, W. Watson. *Inst. Sewage Purification—J. & Proc.*, 1941, pp. 129–136, (discussion) 136–142. Résumé of research on percolating filters showing trend of development; limitations of this method in purifying sewage; alterations to plant and equipment necessary to change over to percolating filter process; costs indicated. Bibliography.

Sewage Analysis. Strength of Sewage: Some Comparative Results, L. Klein. *Inst. Sewage Purification—J. & Proc.*, 1941, pp. 174–185, (discussion) 185–191. Comparison of strengths of several sewages using variety of chemical methods, including method of ceric sulfate; results show that acid potassium dichromate always gives highest values for oxygen absorption, thus indicating more complete oxidation of sewage by this reagent, and confirming opinion that dichromate test affords best single chemical test for rapidly assessing strength of sewage. Bibliography.

Sewers, Construction. Wellpoints Eliminate Sheeting for Sewer. *Eng. News-Rec.*, vol. 130, no. 10, Mar. 11, 1943, pp. 357–359. Wellpoints expedited construction of reinforced-concrete sewer 27 in. in diameter in 14-ft deep trench in sandy soil where water table is only $3^1/_2$ ft below surface; 2 lines of points, one on either side of trench, permitted use of 2:1 side slopes; 18-man crew installed 40 ft of sewer per 10-hour day at cost of $10.50 per lin ft.

WATER WORKS ENGINEERING

Well Drilling, United States. Notes on Early History of Water-Well Drilling in United States, C. W. Carlston. *Economic Geology*, vol. 38, no. 2, Mar.-Apr., 1943, pp. 119–136. Standard cable tool drilling rig was invented and developed in drilling salt wells, following successful completion of first drilled well in 1808 near Charleston, W.Va.; auger boring for artesian water; process of jetting wells, invented in 1884, became chief method of sinking artesian wells in Atlantic and Gulf Coastal Plain by end of century. Bibliography.



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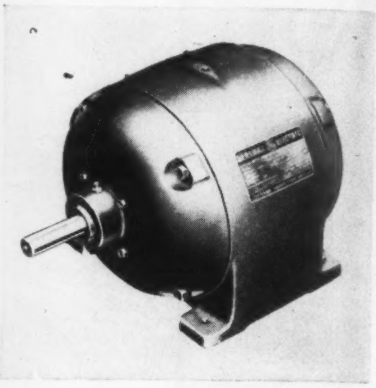

The polyphase motors are furnished in frame sizes 203 to 225. They inclued $^1/_2$, $^3/_4$, and 1 hp at 900 rpm; $^3/_4$, 1 and $1^1/_2$ hp at 1,200 rpm; 1, $1^1/_2$, and 2 hp at 1,800 rpm; and $1^1/_2$ and 2 hp at 3,600 rpm. The single-phase motors are furnished in frame sizes 203 and 204, and include $^3/_4$ hp at 1,200 rpm; 1 and $1^1/_2$ hp at 1,800 rpm; and $1^1/_2$ and 2 hp at 3,600 rpm. The mounting dimensions of these motors are interchangeable with Tri-Clad open motors of the same rating.

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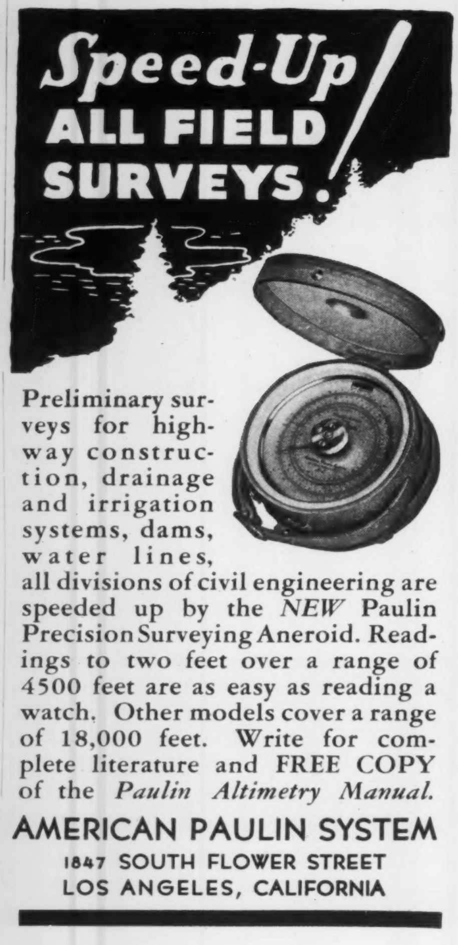
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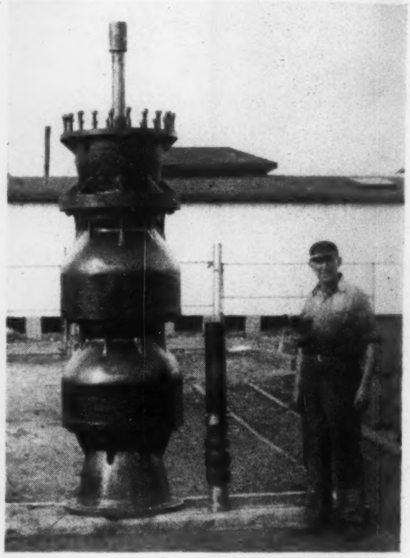
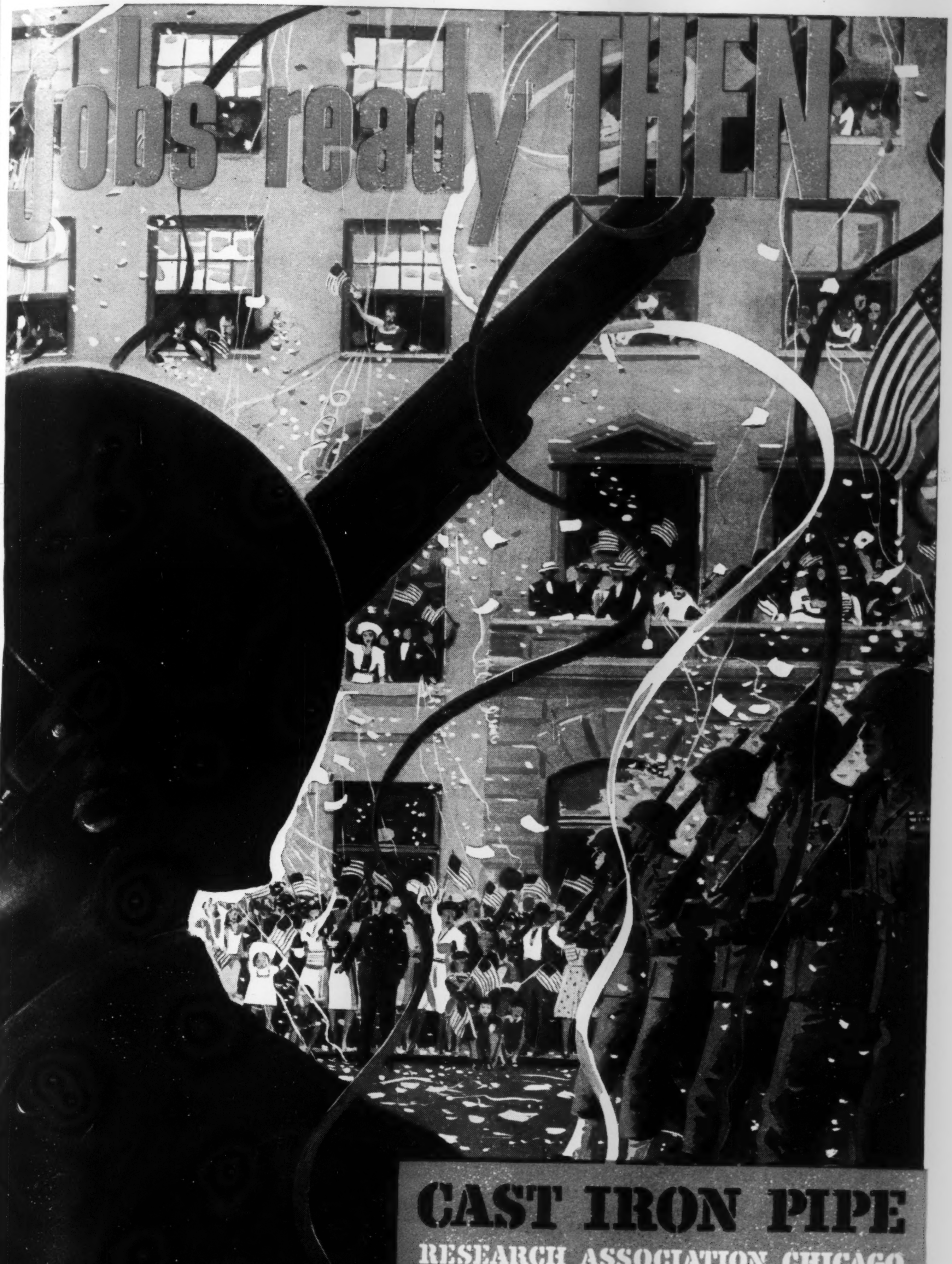
Vertical Turbine Pumps

Layne & Bowler, Inc., Memphis, Tenn., recently has designed and developed a line of high capacity vertical turbine pump bowls. These bowls are intended primarily for pumping water from flowing streams or lakes for war plants, but may be used in big wells for industrial or municipal water supplies.



Five complete pumping units have been fabricated recently for a synthetic rubber plant. These units are equipped with the new two-stage 30-in. Type SKHC Bowls, designed to deliver 11,000 gal per min against a total dynamic head of 169 ft and are driven by 500-hp, vertical, hollow shaft motors. They will be installed in a large diameter caisson and pump water from a flowing stream. Another lot of fifteen complete pumps also for a synthetic rubber plant, wil have newly developed 36-in. Type RKMC, single-stage bowls. Capacity range will be from 11,000 to 14,600 gal per min; pumps driven by 500-hp, vertical hollow shaft, synchronous motors.

This new line of high-capacity, large diameter bowls includes designs for capacities up to 16,000 gal per min, and all bowls are true turbine type. Noteworthy features are the unusually high efficiencies throughout a wide capacity range and the non-overloading type impellers used. These features make the new bowls especially desirable for pumping from rivers or streams where fluctuating water levels are encountered, with consequent variation in capacities and pumping heads.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April 1932, Nov. 1936 to March 1940 and Sept. 1940 to date with American Bridge Co., as Estimator, Draftsman, Checker and (since Sept. 1940) Structural Steel Designer and Estimator; in the interim with Beach Elec. Co., Newark, N.J., and on non-engineering work.

Wallace, James Nicholas (Assoc. M.), Huntington, W.Va. (Age 36) (Claims RCA 2.0 RCM 10.1) Sept. 1925 to Sept. 1926, April 1931 to March 1933 and Dec. 1933 to date with State Road Comm. of West Virginia, as Rodman, Instrumentman, Jun. Engr., Senior Maintenance Engr., and (since Nov. 1942) Acting Dist. Engr. and Dist. Engr.

Wilcox, Gerald Erasmus, Greenwood, Miss. (Age 39) (Claims RCA 4.1 RCM 7.6) May 1942 to date Capt., Corps of Engrs., being Asst. Post Engr., Army Air Base, Savannah, and (at present) at Greenwood (Miss.) Army Air Field; previously with Atlanta (Ga.) Housing Authority, as Office Engr. and Maintenance Engr.; with State Highway Board of Georgia.

Wright, Leslie Austin, Montreal, Que., Canada. (Age 55) (Claims RCA 1.0 RCM 7.9) 1938 to date Gen. Secy., Eng. Inst. of Canada, Montreal.

APPLYING FOR ASSOCIATE MEMBER

Arroyo, Raoul Nicholas (Junior), Santurce, P.R. (Age 29) (Claims RCA 1.6) Oct. 1939 to April 1940 and Dec. 1940 to date with U.S. Engr. Office, first as Jun. Engr., Pittsburgh, Pa., then Senior Draftsman, Asst. Engr. (Civ.), and (since Nov. 1942) Associate Engr., San Juan, P.R.; in the interim Timekeeper, Welding Engrs., Inc., Philadelphia; with Constr. QM., Fort Dix, N.J.

Banner, Joseph Thomas, Denver, Colo. (Age 33) (Claims RCA 8.2 RCM 1.6) Jan. to July 1941 and Sept. 1942 to date with R. J. Tipton, Archt.-Engr., Denver, Colo., as Coordinator, Res. Engr., and (at present) Project Administrator; in the interim Constr. Mgr., A. Guthrie & Co., Inc., and R. J. Tipton, Archt.-Engr.; Constr. Engr., Smith Hinchman & Grylls, Inc., and R. J. Tipton, Archt.-Engr.; Chf. Office Engr. with Walter W. Flora, Archt.-Engr., Cheyenne; previously with WPA, Cheyenne, Wyo.

Bargar, Joseph Lowell (Junior), Pasco, Wash. (Age 32) (Claims RCA 6.5) May 1934 to date with U.S. Engr. Dept. in various capacities, since June 1941 as Associate Engr.

Bartlett, Frank Adams, Portland, Ore. (Age 50) (Claims RCA 18.6) June 1922 to date with Southern Pacific Co., in various capacities, at present as Asst. Field Engr.

Blackwell, Benjamin Richard (Junior), Knoxville, Tenn. (Age 28) (Claims RCA 1.9) June 1939 to date with TVA, as Eng. Aide, Jun. Hydr. Engr., and (since Jan. 1942) Asst. Hydr. Engr.

Blossman, Edward Woodrow, New Orleans, La. (Age 29) (Claims RCA 1.9) Aug. 1942 to date Office Engr., Geo. J. Glover Co., Inc.; previously Chf. Estimator, Brown & Root, Inc.; Engr.-Designer, Mason Hangar Co., and Silas Mason Co., Inc., both of New York City; Draftsman and Estimator with Ole K. Olsen, Inc., New Orleans.

Chavez, Ignacio Paul, San Francisco, Calif. (Age 33) (Claims RCA 1.1 RCM 1.5) Nov. 1938 to date with Federal Power Comm., as Eng. Aide, Jun. Engr., Asst. Engr, and (since Jan. 1942) Associate Engr.

Cliggett, James John, Jacksonville, Fla. (Age 35) (Claims RCA 7.2 RCM 3.8) Dec. 1941 to date Civ. Engr. (Structural), U.S. Engr. Dept.; previously Civ. Engr., Robert & Co., Archt.-Engrs.; Engr.-Inspector of Constr. (General), Solomon & Keis, Archt.-Engrs.; with U.S. Navy, Bureau of Yards & Docks, Public Works Office.

Cooper, Hilton Hammond, Jr., Tallahassee, Fla. (Age 29) (Claims RCA 1.0 RCM 1.5) Sept. 1938 to date Asst. Engr., U.S. Geological Survey.

Cronkhite, Forrest Ivan, Baltimore, Md. (Age 48) (Claims RCA 15.0 RCM 10.0) June 1941 to date Civ. Engr., Corps of Engrs., U.S. Army, Office of Div. Engr., Middle Atlantic Div.; previously Asst. Engr., Baltimore & Ohio R.R. Co.

DeLacy, John Richard, New York City. (Age 33) (Claims RCA 4.1 RCM 1.3) May 1941 to date with U.S. Army Engrs., as Associate Engr., and (since Feb. 1942) Engr.; previously with Bureau of Yards and Docks.

Feodoroff, Nicholas Vasilievich, New York City. (Age 41) (Claims RCA 4.5) July 1939 to date Research Associate in Civ. Eng., Columbia Univ.; at present also member of teaching staff, School of Eng., Manhattan Coll., New York City; previously Research Engr., Board of Water Supply, Honolulu, Hawaii.

Foley, Edward William, Jr., Brooklyn, N.Y. (Age 35) (Claims RCA 8.5) Jan. 1938 to date Vice-Pres., E. W. Foley, Inc.

Garnett, James Clifford, Ft. Belvoir, Va. (Age 31) (Claims RCA 7.8 RCM 1.7) Sept. 1939 to date with Royal Engrs., successively as Lieut., Captain, Adjutant to 2d Corps Troops, Staff Captain, Staff Major, Gen. Staff Officer, and (since Jan. 1943) Engr. Liaison Officer (Major); previously Senior Asst. Engr., Southend Water-Works Co., England.

Georges (formerly Georgakopulus), **James T.** (Junior), New York City. (Age 29) (Claims RCA 3.0 RCM 3.4) Aug. 1940 to date Structural Designer, Contractors for Dry Docks, Navy Yard, New York City; previously with City of New York, as Engr., Dept. of Correction, and (later) Topographical Draftsman, Corporation Counsel; in the interim Asst. Eng. Aide, Constr. QM, U.S. Army, New York City.

Graf, Louis William, Cincinnati, Ohio. (Age 36) (Claims RCA 3.0 RCM 2.5) 1932 to date Civ. Engr. and Surveyor, D. G. Hatmaker & Co., Inc. (D. G. Hatmaker Co.).

Haggstrom, John Vernard, Edmonton, Alberta, Canada. (Age 33) (Claims RCA 4.1 RCM 2.8) Jan. 1943 to date Asst. Chf. Progress Engr., Metcalfe, Hamilton, Kansas City Bridge Companies, Engrs. and Constrs., Kansas City, Mo.; previously Asst. Chf. Progress Engr., Giffels & Vallet, Inc., Archts. and Engrs., Detroit, Mich.; Chf. Cost and Progress Engr., H. H. Henningson, Engrs. and Archts., Omaha, Nebr.

Harbes, John Franklin, Topeka, Kans. (Age 37) (Claims RCA 6.1 RCM 7.2) April 1930 to date with Kansas Highway Comm., as Res. Engr., Squad Chf., Asst. to State Highway Engr., and (since April 1940), Engr. of Highway Planning.

Hass, Raymond Chester (Junior), San Francisco, Calif. (Age 30) (Claims RCA 5.6 RCM 0.5) Sept. 1940 to date with U.S. Army, $1\frac{1}{2}$ years as 1st Lieut., QMC, and since Jan. 1942 Staff Officer, Dist. Engr.'s Staff, San Francisco, at present as Major; previously Constr. Supt. and Civ. Engr., Deere & Co., Moline, Ill.

Hesselgrave, Paul Armour, Cocoli, C.Z. (Age 31) (Claims RCA 5.6) Oct. 1941 to date with Special Eng. Div., The Panama Canal, as Asst. Office Engr., Asst. to Chf., and since Feb. 1942 in Pacific Area office as Asst. Engr.; previously Project Engr., U.S. War Dept., Camp McCoy, Wis.; with WPA in various capacities.

Holloway, Joseph Ogburn, Montgomery, Ala. (Age 39) (Claims RCA 3.9 RCM 4.4) Oct. 1932 to date with Alabama Highway Dept. as Instrumentman, Chf. of Party, Draftsman, and (since Jan. 1939) Chf. Draftsman.

Hopps, John Philip, Provo, Utah. (Age 37) (Claims RC 3.5) 1942 to date Associate Engr., Utah-Pomeroy-Morrison, Gen. Contrs.; previously Jun. Bridge Engr., California Dept. of Public Works, Div. of Highways.

Ingham, Robert Francis, Kingsport, Tenn. (Age 39) (Claims RCA 8.1 RCM 6.6) (Sept. 1942 to date Capt., Corps of Engrs.; previously Architectural and Structural Draftsman and Architectural and Structural Designer and Squad Leader, E. I. Du Pont de Nemours & Co., Wilmington, Del.

Kearney, George William, Charleston, S.C. (Age 41) (Claims RCA 5.9) Aug. 1941 to Feb. 1943 Asst. Head and Feb. 1943 to date Head, San. Sec., U.S. Engr. Corps; previously Draftsman, Sewer Div., District of Columbia, Washington, D.C.

Liddle, Wallace Jorgensen, Fort St. John, British Columbia. (Age 36) (Claims RCA 6.0 RCM 1.2) March 1931 to date with U.S. PRA, as Jun. Highway Engr., Asst. Highway Engr., and (since May 1942) Asst. Highway and Associate Highway Engr.

Luther, Robert Willard, Elizabeth City, N.C. (Age 38) (Claims RCA 8.8) Jan. 1931 to May 1943 Plant Supt. and City Engr., Elizabeth City, N.C.

Mackenzie, Kenneth Victor, Kingston, Wash. (Age 31) (Claims RCA 2.5) Sept. 1941 Physicist, Bureau of Ordnance, and (after June 1942) Civil Service, having rating of Associate Physicist; previously with Oregon Highway Dept.

Masciocchi, Pius James (Junior), Wilmington, Del. (Age 29) (Claims RCA 3.0 RCM 2.0) June 1937 to date with E. I. du Pont de Nemours & Co. in various capacities, since Jan. 1943 as Contr. and Cost Engr., Constr. Div.

O'Malley, John, San Francisco, Calif. (Age 34) (Claims RCA 2.8) June 1942 to date with U.S.N.R. first in training, then Field Supt. and Asst. Engr., and (since Dec. 1942) Progress Engr.; previously with California Div. of Highways in various capacities.

Oppenheim, Louis Herman (Junior), Oakland, Calif. (Age 30) (Claims RCA 3.8) May 1938 to date with Henry J. Kaiser Co. (since March 1942 Kaiser Co., Inc.), successively as Engr., Asst. to Chf. Engr., and (since March 1942) Asst. Chf. Engr.

Pollard, James Joseph, New Orleans, La. (Age 35) (Claims RCA 5.5 RCM 1.0) 1941 to date Instructor, Tulane Univ.; previously (1938 to 1941) student; Contr. (private practice), Greenwood, Miss.

Poppell, Edgar Allan, Jacksonville, Fla. (Age 35) (Claims RCA 13.8) Aug. 1942 to date with Fortification Div., U.S. Engrs. Office, as Structural Engr.; previously with Farquhar Machinery Co. (Bushnell Steel Co., Structural Steel Fabricators), Jacksonville.

Porter, Arza Francis (Junior), New Orleans, La. (Age 33) (Claims RCA 3.7) Feb. 1941 to date with U.S. Navy, 8th Naval Dist., Public Works Dept., as Asst. Structural Engr., Associate Structural Engr., and (since April 1943) Structural Engr.; previously with SCS, U.S. Dept. of Agriculture in various capacities.

Puckhaber, Fred Henry, Dallas, Tex. (Age 43) (Claims RCA 10.0 RCM 9.0) March 1922 to date with Wallace & Tiernan Co., Inc., Newark, N.J., as Field Engr., and (since March 1924) Southwestern Mgr.

Smith, Landon Edwards, Kingsport, Tenn. (Age 39) (Claims RCA 4.6 RCM 2.7) July 1942 to date with Holston Ordnance Works, as Structural Engr., and (since Dec. 1942) Field Engr.; previously with Smithey and Boynton, Roanoke, Va., as Architectural Draftsman, Senior Draftsman and Chf. Draftsman.

Sterling, Percy Gillmore, Salisbury, Md. (Age 35) (Claims RCA 4.8 RCM 1.8) Sept. 1941 to date associated with Clarke Gardner, Cons. Engr.; previously with City of Salisbury, Md., as Field and Office Engr., and Designing Engr.

Taradash, Samuel, Chicago, Ill. (Age 27) (Claims RCA 2.7) April 1942 to date Chf. Engr., United Concrete Form Products Co.; previously Designer, Universal Form Clamp Co.; Inspector of concrete and earthwork construction, International Boundary Comm., United States and Mexico.

Van Driest, Edward Reginald (Junior), Storrs, Conn. (Age 29) (Claims RCA 2.0) Sept. 1942 to May 1943 Associate Prof. of Civ. Eng., Univ. of Connecticut; previously Asst. Engr., U.S. Engrs.' Office, Philadelphia, Pa.; Instructor, Cornell Univ.; Structural Designer, Arch-Rib Truss Co., Los Angeles, Calif.

Ward, Edmund Bailey, Baltimore, Md. (Age 44) (Claims RCM 14.3) Feb. 1927 to Feb. 1932 and Feb. 1937 to date with Consolidated Eng. Co., Inc., as Asst. Mgr., Bldg. Dept., Project Mgr. and (since Aug. 1941) Vice-Pres. and Company's Representative; in the interim Pres. Eng. Contr. Corporation.

Whitten, Eudell Garfield, Ft. Dix, N.J. (Age 33) (Claims RCA 8.3 RCM 0.8) Aug. 1942 to date Chf. Designer and Res. Engr., Tuttle, Seelye, Place & Raymond, New York City; previously Asst. to Res. Engr. and Designer, New England Public Service Co., Augusta, Me.; Jun. Engr., Res. Engr. and Designer, Maine Highway Comm., Augusta.

Wiard, Leon Allen, Ithaca, N.Y. (Age 33) (Claims RCA 3.3) Sept. 1938 to date with U.S. Dept. of Interior, Geological Survey, Water Resources Branch, as WPA appointee, Jun. Hydr. Engr. and (since July 1942) Asst. Hydr. Engr.

Wilson, George Roscoe, Sault Ste. Marie, Mich. (Age 62) (Claims RCA 3.3 RCM 2.2) Oct. 1942 to date Inspector on new lock construction; previously with U.S. Engr. Office; with U.S. Navy in Aleutian Islands; and Chf. of Party, Genesee County, Mich.

Witzig, Berard John (Junior), Orchard Park, N.Y. (Age 30) (Claims RCA 3.3 RCM 0.7) Oct. 1937 to date with U.S. Engr. Office, Buffalo, N.Y., in various capacities, at present as Engr. (Civ.).

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Donoghue, Edward Patrick, Washington, D.C. (Age 24) Nov. 1941 to date Jun. Engr., T.M.B. Bureau of Ships, U.S. Navy Dept.; previously with Glenn L. Martin, as Draftsman and Stress Analyst.

Eiffert, William Truesdell, Bremerton, Wash. (Age 27) (Claims RCA 1.1) July 1940 to date with U.S. Public Health Service, as Jun. Public Health Engr., Asst. Public Health Engr., and (since Jan. 1943) Asst. San Engr. (R).

Jordan, Mark Henry, Washington, D.C. (Age 28) June 1942 to date Executive Officer, Sixth Naval Constr. Bn.; previously graduate student, Rensselaer Polytechnic Inst.; Jun. Watch Officer and Watch Officer, U.S.S. *Minneapolis*.

Rickey, Leroy Edward, Vancouver, Wash (Age 25) (Claims RC 0.8) March 1942 to date Asst. to Gen. Supt., Kaiser Co., Inc., Vancouver, Wash; previously Production and Quantity Engr., Oregon Shipbuilding Corporation, Portland; Office Engr., Field Engr. and Relief Shift Walker Consolidated Bldrs., Inc., Grand Coulee Dam, Wash.

Smith, Donovan, Los Angeles, Calif. (Age 29) Aug. 1942 to date Jun. Engr., U.S. Eng. Dept.

1942 GRADUATES

CASE SCHOOL OF APPLIED SCI.
(B.S. in Civ.Eng.)

	Age
Richmond, Richard Thomas	(22)

OKLA. A. & M. COLL.
(B.S. in Civ.Eng.)

McDonald, Kenneth Osborn	(24)

1943 GRADUATES

ALA. POL. INST.
(B.C.E.)

Blackwell, Guy Braxton, Jr.	(24)
Holman, John Adam	(21)

UNIV. OF ARIZ.
(B.S. in C.E.)

Adams, William Pearson	(24)
Dennis, Karl Alfred	(23)
Plumb, Theda Mary (Miss)	(22)
Wilbur, George Everett	(28)

BROOKLYN POL. INST.
(B.C.E.)

Soehngen, Henry Frank	(22)

UNIV. OF CIN.
(C.E.)

Agsten, Robert Erwin	(23)
Harding, John Eldon	(24)
Humphreys, Richard Brown	(22)
Jennings, Royce Merlyn	(22)
Kral, George Joe	(22)
Macon, Boise Ford	(23)
Weisbacher, Kurt Max	(22)

UNIV. OF CONN.
(B.S.)

Adams, Harrold Nelson	(21)
Burton, Philip Alex	(22)
Joyce, Calvin Richard	(21)

UNIV. OF DEL.
(B.C.E.)

Snyder, Eugene Fones	(22)

GEORGE WASHINGTON UNIV.
(B.C.E.)

Ballard, Richard Patton	(26)

UNIV. OF ILL.
(B.S.)

Snyder, Isaac Sterling	(22)

(B.S. in A.E.)

Schroeder, Marianna Margaret (Miss)	(21)

UNIV. OF IOWA
(B.S. in C.E.)

Hotchkiss, Gerald Richard	(22)

KANS. STATE COLL.
(B.S. in C.E.)

Anderson, Van Keith	(21)
Campbell, George Frederic	(22)
Daniels, Orval William	(22)
Gelwix, Max	(21)
Gish, Ellis Victor	(25)
Lennington, Lee Roy, Jr.	(22)
Stallings, John Ralph, Jr.	(23)

LAFAYETTE COLL.
(B.S. in C.E.)

Coffin, Robert Cleveland, Jr.	(22)

LEHIGH UNIV.
(M.S.)

Brandes, Joseph Leon	(23)
Brodsky, Andrew	(24)

(B.S. in C.E.)

Brubaker, John Henry, Jr.	(21)
Fisher, Robert Joseph	(22)
McGee, John Joseph	(21)
Moore, Robert Condit	(21)
Palazzo, Ralph Dominick	(22)
Schaper, David Henry	(22)
Titlow, Lester Edwin	(22)

UNIV. OF LOUISVILLE
(B.C.E.)

Munich, James Anthony	(21)

MASS. INST. TECH.
(S.B.)

Gayton, John Edward	(22)
Gonzalez-Angel, Angel Maria	(22)
Tan, Eng Joo	(23)

UNIV. OF MINN.
(B.C.E.)

Doepke, Henry August	(22)
Reina, Guillermo Arturo	(24)

MISS. STATE COLL.
(B.S. in Civ.Eng.)

Hathorn, Stanley Jay	(24)

UNIV. OF MISS.
(B.S. in C.E.)

McLain, Howard McMillan	(22)
Merrill, Bergen S., Jr.	(20)
Roberds, Billy	(22)
Waggoner, Sam W., III	(20)

MO. SCHOOL OF MINES AND MET.
(B.S. in C.E.)

Doerres, John Herman, Jr.	(21)
Glover, James	(21)
Lowrey, Joseph James	(21)

MONTANA STATE COLL.
(B.S. in C.E.)

Eagle, Harold Leroy	(21)
Leuschen, Howard Wilson	(26)
Schwenneker, Arthur Lee	(24)
Tietjen, Frederick Henry	(23)

UNIV. OF NEV.
(B.S. in C.E.)

McCutchan, James William	(27)

UNIV. OF N.H.
(B.S. in C.E.)

DiMartino, Dominic Donald	(22)
Giovannangeli, Ottavio	(26)
Pope, Robert Millard	(23)
Richards, John Vinton	(24)
Smart, Philip Edward	(21)
Tasker, James Henry, Jr.	(21)

N.MEX. STATE COLL.
(B.S. in C.E.)

Carroon, Lamar Evan	(20)
Rivas, John Anthony	(25)

N.Y. UNIV.
(B.C.E.)

Birnbaum, Arthur	(20)
Chin, Hing-Yuey	(25)
Halper, Harold Herbert	(21)
Hurwitz, Stanley Simon	(22)
Rosenwach, Wallace	(21)

OKLA. A. & M. COLL.
(B.S. in Civ.Eng.)

Bowles, William Roberts	(22)
Hallock, Donald Nicholson	(20)
Hapke, Daniel Boy	(22)
Parsons, Donald Clark	(21)
Robins, George Patrick	(32)

UNIV. OF OKLA.
(B.S. in C.E.)

Borgwald, Carl Ray	(21)
Stacy, Joe Terrell	(22)

ORE. STATE COLL.
(B.S. in C.E.)

Niemi, Toiva Henry	(22)
Skans, William Samuel, Jr.	(22)

PRINCETON UNIV.
(B.S.E.)

Panagos, Peter	(21)
Richards, Robert Wadsworth	(22)

UNIV. OF SANTA CLARA
(B.C.E.)

Brown, Franklin Andrew	(21)
Dent, Juan, Jr.	(22)
McCarthy, Leonard Richard	(22)

STANFORD UNIV.
(A.B. in Eng.)

Knowles, Samuel Givens	(22)
Rouverol, William Spence	(25)

SYRACUSE UNIV.
(B.C.E.)

Boster, Robert Daniel, Jr.	(24)
Carpenter, James Eugene	(22)
Johnson, Clyde Oliver	(22)
Quinby, Ira, Jr.	(24)
Shub, David Isaac	(21)
Tuttle, Lansing	(26)

UNIV. OF TENN.
(B.S. in C.E.)

Sheegog, Robert McCormick	(24)
Smith, Wade Wagner	(21)

AGRI. & MECH. COLL. OF TEX.
(B.S. in C.E.)

Cullum, Thomas Ashley, Jr.	(22)
Jones, Truman Ross, Jr.	(22)

TULANE UNIV.
(B.E. in C.E.)

Adey, Edward Alonzo, III	(27)
Fromherz, Frank Charles	(21)
Jeffrey, Neill Pressley, Jr.	(20)
Johnson, Roy Ernest	(22)
Lee, Joseph Thomas	(21)
O'Donnell, Herbert, Jr.	(20)
Pennebaker, Frank Martin	(22)
Solanas, Homer Delph	(23)

(B.S. in C.E.)

Stancliff, Arthur Dale, Jr.	(21)

UTAH STATE AGRI. COLL.
(B.S.)

Reeve, Ronald Cropper	(23)

VA. POL. INST.
(B.S. in C.E.)

Malcolm, Charles Buck, Jr.	(22)

STATE COLL. OF WASH.
(B.S. in C.E.)

Julius, Donald Adrian	(20)
Luck, Leon Dan	(22)
Miller, Merwin Hammond	(22)

W.VA. UNIV.
(B.S. in C.E.)

Cappellari, Amerigo Severino	(26)

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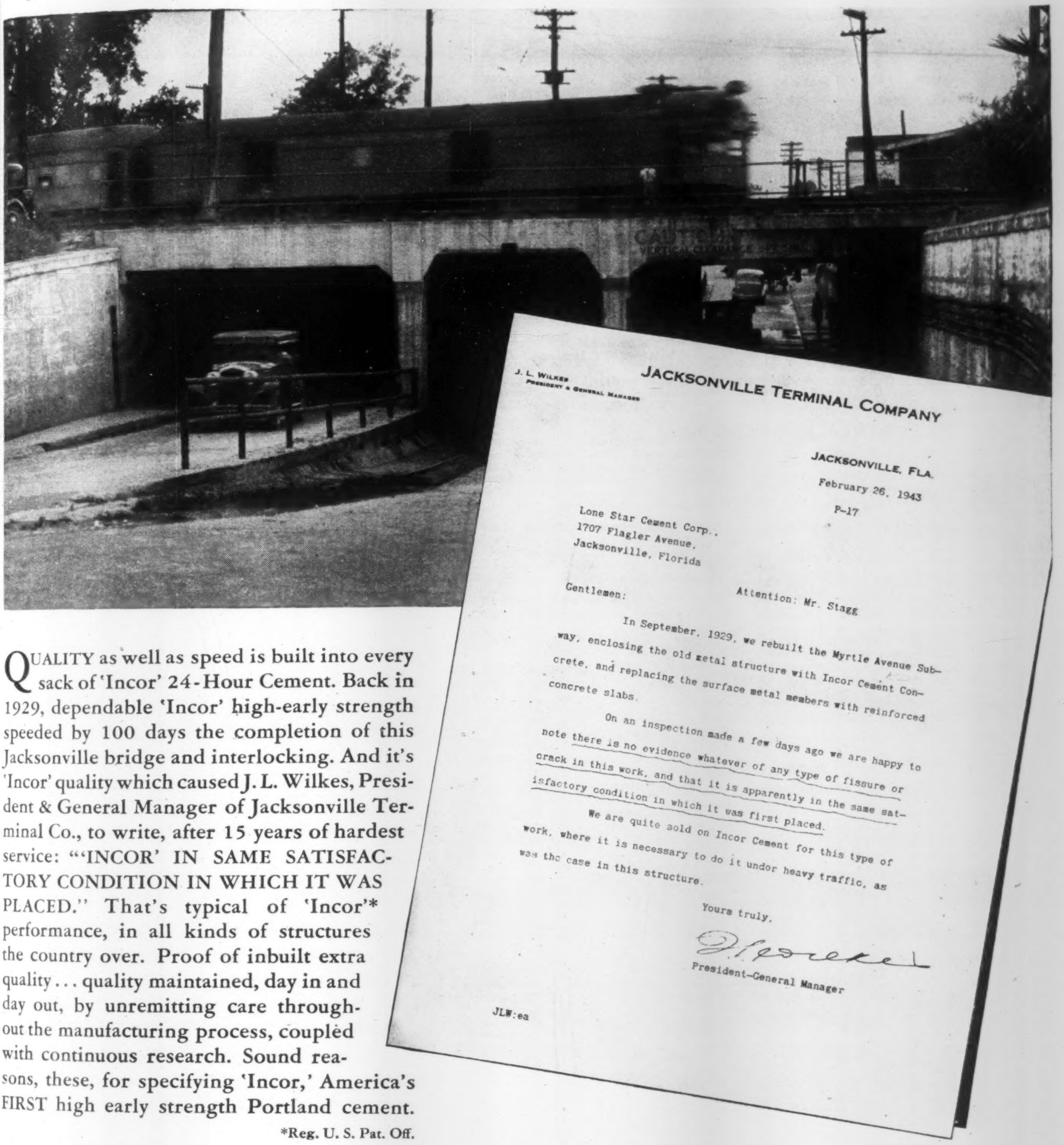

J. L. Wilkes
President & General Manager

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Men Available

Civil Engineer; Jun. M. Am. Soc. C.E.; citizen; married; 25; B.S.C.E., 1940; 14 months hydrologic surveying; 8 months teaching hydraulic laboratory; 12 months shipyard production planning, rate setting, structural steel inspection. Desires position as field engineer, production engineer, instructor. C-986.

Structural Engineer; M. Am. Soc. C.E.; 50; European college graduate; married; American citizen; 20 years' experience in United States in design, estimating, and checking of every type of building, heavy foundations, hydraulic structures, arches, subways, grade-crossing eliminations, etc.; wants permanent connection. Location immaterial. C-987.

Graduate Civil Engineer; M. Am. Soc. C.E.; 35; American; married; 2 children; registered professional engineer, Iowa and Pennsylvania; 13 years' responsible experience in design of important structures for powerhouses, bridges, office and industrial buildings; 2 years' executive experience; thoroughly familiar with rigid-frame structures; also process engineer for aircraft company. Will go anywhere. C-988.

Civil Engineer; Jun. Am. Soc. C.E.; young; 2 years' experience drafting and designing steel, concrete, and wood; wishes field work with construction company or instructor's position at accredited college with opportunities to work for master's degree. Not subject to draft because of slight physical defect in right arm. Will go anywhere. C-989.

Assistant Professor of Civil Engineering; Jun. Am. Soc. C.E.; 28; B.S.C.E., M.C.E., with major in structures; 15 months' teaching experience; registered surveyor; 4 years' experience on highway, airport, irrigation, steel, and concrete construction work. Desires position of permanent nature. C-990.

Bridge Engineer; Assoc. M. Am. Soc. C.E.; 39; B.S.C.E. and C.E., University of Illinois; licensed; experienced in design and construction of all types of highway bridges; some railroad experience. Desires permanent connection with organization for post-war planning and designing and after-war designing and construction; prefers Rocky Mountain or Pacific Coast region. C-991.

Civil Engineer, Executive or Office Engineer; Assoc. M. Am. Soc. C.E.; age 45; married; 26 years' engineering experience, consisting of design and construction of TNT plant, housing, paving utilities, etc.—18 years of this experience in executive or supervisory capacity, both field and office. C-992.

High-Grade Civil and Mechanical Engineer; M. Am. Soc. C.E.; B.S. in M.E.; expert structural designing engineer in all structural materials; expert construction engineer capable of planning and constructing military cantonments and manufacturing plants and all utilities. Has had considerable mechanical experience on heating and water and sewer systems, road and railroad construction, and pipe checking. Has also had considerable foreign experience. Talks, reads, and writes Spanish, some German and French, also some Japanese. C-993.

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Instructor in Civil Engineering, qualified to teach junior and senior civil engineering subjects, university now 100% on the Army specialized war-training programs. Salary, $2,200–$2,400 for calendar year. Location, New England. W-1973.

Technical Writer. Should be a graduate civil, mechanical, or architectural engineer who has a thorough knowledge of construction materials. Permanent. Salary, $4,200 a year. Location, New York, N.Y. W-2134.

Civil or Hydraulic Engineers. Apply by letter giving complete information. Salaries, from $1,200–$3,600 a year. Positions available in various locations in the State of Illinois. W-2162.

Structural Draftsmen for detailing of prefabricated timber work and structural steel. Permanent. Salary, $3,000 a year for a 40-hour week. Location, New Jersey. W-2190.

Aeronautical Engineers with ability to do accurate work in stress analysis. Prefer men draft deferred. Salary, $2,600–$5,200 a year, depending upon experience and training in aircraft. Location, New York State. W-2285.

Superintendent of Water and Sanitation Distribution, control of supply, chlorination, estimates from rainfall data, daily charting of use, etc., of fresh water, distribution of salt-water supply. Supervision of pumping equipment and operating personnel; supervision of sewerage system and incinerator. Civil engineer with at least 5 years' experience in charge of water supply and sewerage in either small city or medium-sized community desirable. Salary, $4,000–$4,600 a year. Location, foreign. W-2370.

City Engineer, civil, for small community having its own water system, street repair department, etc. Will also act as village clerk to a board of aldermen. Salary, $3,000–$3,600 a year. Permanent. Location, within commuting distance of New York. W-2376.

Instructor or Assistant Professor to teach lecture and laboratory courses in bacteriology, sanitation, and public health to civil engineering students. Other courses open are in water supply, sewerage, microscopy, general biology, and related subjects. Starts September 1. Must be graduate in science, civil, sanitary, or public health engineering and have taken two or more laboratory courses in bacteriology or sanitary analysis. Salary, $1,800–$2,400 for 9 months' teaching, plus supplementary salary of $450–$600 for 12 weeks' summer teaching. Permanent. Location, Middle West. W-2383.

Sales Engineer, preferably over 38, with some experience in sales or design on highway or asphalt. Must be draft exempt. Salary, $3,600 a year, plus expenses. Location, Pennsylvania. W-2386.

Civil, Electrical, Mechanical, and Aeronautical Engineers, preferably aeronautical engineering graduates, who have ability to work in aeronautical industry. Will receive a thorough training, probably beginning work as a draftsman. Civil engineers interested in structural design will work with such structures as fuselage, wing, and empennage, etc. The structures are dynamic rather than static. Company manufactures heavy aircraft. Salaries dependent upon education and experience—from $200 a month to $300, plus 42% for overtime. Location, state of Washington. W-2394.

RECENT BOOKS

New books of interest to Civil Engineers donated by the publishers and filed in the Engineering Societies Library, or in the Society's Reading Room, will be found listed here. The notes regarding the books are taken from the books themselves and are edited by members of the staff of the Society or of the Library. Those books which are in the Library may be borrowed by mail by Society members for a small handling charge.

Applied Mathematics for Technical Students. (Rochester Technical Series.) By M. S. Corrington. Harper & Brothers, New York and London, 1943. 226 pp., diagrs., tables, $9 \times 5^{1}/_{2}$ in., cloth, $2.20, without tables; $2.80, with tables; 75 cents for tables alone.

Arithmetic, algebra, logarithms, and trigonometry are all included in this small volume, which is intended for trade schools, factory courses, or pre-engineering study. The book is also suitable for home study. Emphasis is on the practical applications. The text is based upon careful study of the mathematics essential in modern industry.

Secondary Recovery of Oil in the United States, sponsored by various committees of the American Petroleum Institute, New York (50 West 50th St.), 1942. 259 pp., illus., diagrs., charts, maps, tables, 11 × 8 in., fabrikoid, $3.50.

This volume contains a collection of papers upon the recovery of petroleum by injecting air and gas into underground reservoirs or by flooding them with water. The papers contain the best information available at present on the economics of the methods, on the porosity, permeability, thickness, and area of oil-producing reservoirs and on the amounts of oil recovered and recoverable by these methods. Each paper is by an author with practical experience in the field of which he writes.

(The) Handbook of Architectural Practice. American Institute of Architects, Washington D.C. (1741 New York Ave.), N.W., 1943. 204 pp., charts, tables, 11 × 8 in., cloth, $5.

The handbook discusses such questions as the relations between architect and owner, the organization and routine of the architect's office, studies and surveys preliminary to building, the letting of contracts and the execution of work, and the laws governing architectural practice. Issued by the American Institute of Architects, the book is a practical guide.

Theoretical Soil Mechanics. By K. Terzaghi. John Wiley & Sons, Inc., New York; Chapman & Hall, London, 1943. 510 pp., diagrs., charts, tables, $9^{1}/_{2} \times 6$ in., cloth, $5.

In this volume the author confines himself to theoretical principles exclusively, limiting himself "to theories which have stood the test of experience and which are applicable, under certain conditions and restrictions, to the approximate solution of practical problems." The treatment covers the general principles involved in the theories of soil mechanics, the conditions for shear failure in ideal soils, and the mechanical interaction between solid and water in soils. There is an extensive bibliography of sources.

Vector and Tensor Analysis. By H. V. Craig. McGraw-Hill Book Co., New York and London, 1943. 434 pp., diagrs., tables, 9 × 6 in., cloth, $3.50.

This text is intended primarily for those who use vector and tensor analysis as a tool. For them it provides a fairly rigorous course, which does not call for a thorough knowledge of modern advanced calculus, but only for acquaintance with the standard first course in the subject. The book opens with a section that supplies the necessary mathematical background. This is followed by a section on elementary vector analysis, and one on tensors and extensors. The final section considers some applications to classical dynamics and to relativity.

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Selected items for the current Civil Engineering Group of the Engineering Index Service, 29 West 39th Street, New York, N.Y. Every article indexed is on file in The Engineering Societies Library, one of the leading technical libraries of the world. Some 2,000 technical publications from 40 countries in 20 languages are received by the Library and are read, abstracted, and indexed by trained engineers. With the information given in the items which follow, you may obtain the articles from your own file, from your local library, direct from the publisher, or they may be borrowed from the Engineering Societies Library. Photoprints will be supplied by this library at the cost of reproduction, 25 cents per page to members of the Founder Societies (30 cents to all others), plus postage, or technical translations of the complete text may be obtained at cost.

ROADS AND STREETS

Airport Runways. Design of Flexible Pavement Foundations, T. A. Middlebrooks. *Roads & Streets*, vol. 86, no. 3, Mar. 1943, pp. 44–48. California method of designing flexible pavements adapted as best present available method; additional investigations are necessary to perfect its use for airfields; it is expected that modifications will be found necessary in design curves, in assumptions, and in method of conducting California bearing ratio test.

Airport Runways. Airport Paved During Winter. *Western Construction News*, vol. 18, no. 2, Feb. 1943, pp. 59–60. Site relocation and land acquisition delay start of Northwest airport until after advent of freezing weather, necessitating special subgrade preparation and aggregate, mixing, and curing techniques.

Construction. Load-Transfer Sills Under Dowel-Less Joints. *Roads & Streets*, vol. 86, no. 4, Apr. 1943, pp. 47–49. Two concrete access road projects under construction in New Jersey afford interesting examples of pavements designed to conserve critical material to utmost; principal design feature is use of concrete load transfer slabs under expansion joints to offset lack of dowels; these projects are described—one is Picatinny Arsenal Access Road near Dover, N.J., and other is Fort Dix Access Road.

Expressways and Parkways, Detroit. Speed and Steel Saving Mark Construction by 20 Contractors of Expressway for Detroit War Industries, *Construction Methods*, vol. 25, no. 2, Feb. 1943, pp. 52–55, 106, 108, 110, 112, 114, 118–119, and 122. General features of bridge and roadway construction on 11-mile link connecting previous access roads; concrete pavement, designed as 9-in. uniform thickness slab without reinforcement, tie-bars, or load transfer devices at expansion joints; 2-lane roadways, 24 ft wide paved to full width, with center-line joint cut 2$^1/_2$ in. deep into fresh concrete and filled with pre-molded ribbon.

Great Britain. Wartime. Road Construction, J. G. Bramwell. *Surveyor*, vol. 102, no. 2664, Feb. 12, 1943, pp. 69–71. Various stages in preparation and execution of road improvement scheme; procedure in carrying out improvement projects. Before Instn. Mun. & County Engrs.

Guard Rails. Constructing Highway Guards Under Wartime Limitations on Critical Materials. *Roads & Bridges*, vol. 81, no. 4, Apr. 1943, pp. 28–30, 60, and 62. Recommendations formulated by Committee on Highway Guard of Highway Research Board to cover guard-rail design under current conditions; earth-mound, boulder, masonry, and timber guards, and combination timber and boulder guard are described.

Highway Systems, Alaska. Alaska Highway—Organizing $30,000,000 Job, T. H. MacDonald, L. I. Hewes, and J. S. Bright. *Western Construction News*, vol. 18, no. 2, Feb. 1943, pp. 55–58. Route reconnaissance, spotting of construction contractors along 1,480-mile line, and transportation of heavy equipment into areas without transportation facilities of any sort provided unprecedented problems for engineers of Public Roads Administration.

Highway Systems, Alaska. Design Problems Presented by Soil and Climatic Conditions on Alcan Highway, A. C. Clark. *Pac. Bldr. & Engr.*, vol. 49, no. 3, Mar. 1943, pp. 38, 40, 42, and 44–45. Soils run from solid rock to muskeg; design of subgrade; compacting heavy soils; drainage problems in mountains; Yukon plateau; advance and retreat glaciers; permanently frozen ground; "glaciering" causes trouble; insulating drains; frost heave and spring thaw; standards of alignment; bituminous surface contemplated.

Highway Systems, Pan-American. Pan-American Highway. *Ry. Gaz.*, vol. 78, no. 11, Mar. 12, 1943, pp. 267–268. Considerable progress is being made with completion of this highway, lengthy sections of which are in use; sketch map given.

Maintenance and Repair. Maintenance of Bituminous Concrete and Oil Penetration Urban Roads, I. R. Riker. *Pub. Works*, vol. 74, no. 3, Mar. 1943, pp. 22–23, 38, and 40. Years of application of oil-bound wearing surface to streets of Princeton Borough, N.J., has resulted in uneven surface and high crown; rebuilt with bituminous concrete and oil penetration on crushed stone, they are giving good service with reduced cost of maintenance.

Maintenance and Repair, Ohio. Ohio Maintenance Geared to Wartime, H. D. Metcalf. *Roads & Streets*, vol. 86, no. 4, Apr. 1943, pp. 39–43. Unique snow and ice patrol, priority basis for repair funds, 1-day schools for foremen are features of Ohio's $15,000,000 state road maintenance program.

Panama. Panama Roads and Bridges Built at Top Speed to Aid in Defense of Canal. *Construction Methods*, vol. 25, no. 2, Feb. 1943, pp. 46–47 and 105. Particulars of Trans-Isthmian project which extends from near Colon to Madden Dam, distance of 24$^1/_2$ miles, and Chorrera-Rio Hata road, section of Inter-American Highway.

Post-War. Post-War Highway Development, G. D. Kennedy. *Eng. News-Rec.*, vol. 130, no. 12, Mar. 25, 1943, pp. 437–438. Outline of plans for post-war development in view of highway needs; replacements being considered. Before Assn. Highway Officials, North Atlantic States.

Post-War. Post-War Planning—State Highway Plans. *Western Construction News*, vol. 18, no. 2, Feb. 1943, pp. 70–72. Summaries of post-war planning activities of state highway departments in Colorado, Washington, Oregon, and Utah; also in Los Angeles and Stockton, Calif.

Review. Transformation in Roads, Z. E. Sevison. *Better Roads*, vol. 13, no. 3, Mar. 1943, pp. 11–13 and 29–30. Brief commentary on road and highway developments since 1917.

Stabilization. Wartime Road Problems—Granular Stabilized Roads. *Nat. Research Council—Highways Research Board—Bul., no. 5*, Feb. 1943, 27 pp. Structure of granular stabilized roads and classification of materials for use; recommended practice for materials and mixtures; maintenance practices.

SANITARY ENGINEERING

Effect of War. Forum: Influence of War on Sanitary Engineering. *Sewage Works J.*, vol. 15, no. 2, Mar. 1943, pp. 181–189. Introductory Remarks, L. H. Enslow; Point of View of State Departments or Boards of Health, discussed by C. A. Holmquist; Influence of War Upon Sanitary Engineering, presented by C. G. Hyde; What War Has Done for Sanitary Engineering, discussed by W. M. Piatt; Effects of War with Which Operator of Sanitary Facilities Has Been Confronted, dealt with by G. J. Schroepfer.

SEWERAGE AND SEWAGE DISPOSAL

Activated Sludge. Three Years' Treatment of Sewage at Celina, Ohio, P. A. Uhlmann. *Pub. Works*, vol. 74, no. 3, Mar. 1943, pp. 13–17. Unusual combination of industrial wastes and domestic sewage treated by activated sludge preceded by chemical treatment.

Camps, Military, Sewage Disposal. "Demountable" Army Camp Plants of Substitute Materials, W. Johannesen. *Sewage Works Eng. & Mun. Sanitation*, vol. 14, no. 1, Jan. 1943, pp. 13–14. Design features of two plants recently constructed; substitution of wood stave tanks for reinforced concrete tanks, elimination of ferrous pipe by designing for use of vitrified clay pipe, and general use of irrigation design practice for details, instead of flanged piping, has resulted in considerable reduction in weight of metal required.

Disposal Plants, Equipment. Experience with Mechanical Equipment at Epsom and Ewell Sewage Works, H. H. Stanbridge and R. W. Hescroff. *Surveyor*, vol. 102, no. 2673, Apr. 16, 1943, pp. 163–165. Experiences are reported on adequacy of design and operation of plant equipment, including boilers and steam engines, electric motors, diesel and gasoline engines, air compressors, ejectors, and centrifugal pumps. Before Inst. Sewage Purification.

Disposal Plants. Modern Sewage Treatment Processes, J. V. N. Dorr. *Eng. & Contract. Rec.*, vol. 56, no. 11, Mar. 17, 1943, pp. 10–12 and 23–24. Genealogy of evolution of modern mechanical sewage treatment plants. Before Third Annual Convention & Wartime Conference of Federation of Sewage Works Assn.

Disposal Plants, Wartime. War-Time Construction Adds Over 645 Sewage Works, M. M. Cohn. *Sewage Works Eng. & Mun. Sanitation*, vol. 14, no. 2, Feb. 1943, pp. 76–85. Statistical data; military and war-related facilities account for half of 1942 treatment plants; $50,000,000 spent for civilian plants; many pocket-sized plants built; industrial waste treatment; few plants required in 1942.

Disposal Plants, Wartime. Sewerage Project Designed Without Critical Materials, P. E. Langdon. *Sewage Works J.*, vol. 15, no. 2, Mar. 1943, pp. 169–178, (discussion) 178–179. Details of plant which comprises sewage pumps, screens, grit chambers, sedimentation, and chlorination with separate sludge digestion, dewatering, and ultimate disposal as low-grade fertilizer; plant designed under war conditions and with war limitations on materials and equipment follows these conceptions in structures and provides for adaptation of mechanical equipment when it becomes available.

Flotation. Sewage Treatment by Flotation, C. A. Hansen and H. B. Gotaas. *Sewage Works J.* vol. 15, no. 2, Mar. 1943, pp. 242–252, (discussion) 252–254. Typical results of preliminary investigation presented, which show possibility of sewage treatment by flotation process in which chemical flotation reagents were used to promote flotation; authors do not claim that flotation process is at present satisfactory process for sewage treatment, but show experimental results which are believed to indicate that flotation method may have possibilities in field of sewage treatment which justify further research. Bibliography.

Gas Recovery. Design of Sludge Digesting Tanks for Efficient Gas Production, A. B. Kozma. *Water Works & Sewerage*, vol. 90, no. 1, Jan. 1943, pp. 25–27. How to design sludge-digesting tanks with regard to effective and economical heat insulation and efficient and economical gas production; what expedients to use if heat supply is insufficient.

Industrial Wastes. Vacuum Flotation—New Process for Sewage and Industrial Waste Treatment, A. J. Fischer. *Eng. News-Rec.*, vol. 130, no. 8, Feb. 25, 1943, pp. 297–301. Grease and difficult-to-settle solids in sewage may be removed prior to sedimentation by new process of vacuum flotation; process can be applied also to treatment of cannery and oil refinery wastes to produce results that may eliminate need for further treatment before discharge; design and operating principles of process mechanism, called "Vacuator," is described, along with pilot plant and other tests.

Industrial Wastes. Treatment of Defense Plant Waste, R. Eliassen and C. N. Sawyer. *Water Works & Sewerage*, vol. 89, no. 12, Dec.

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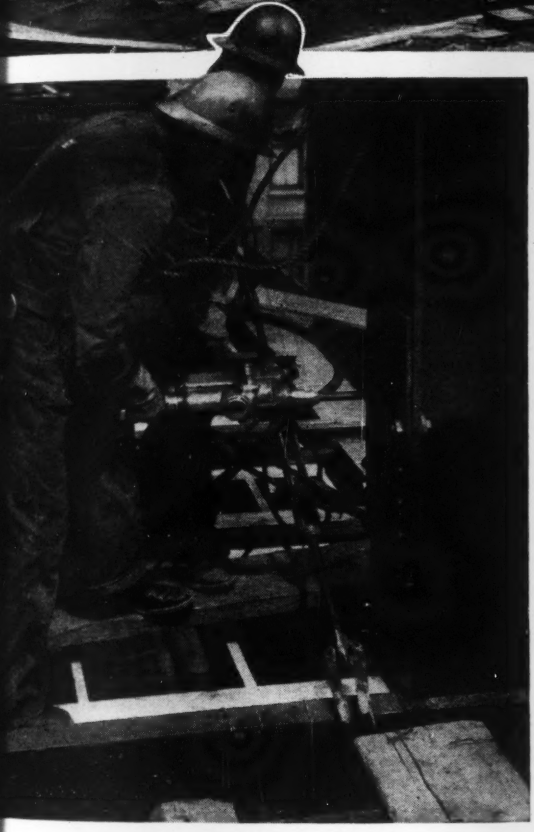

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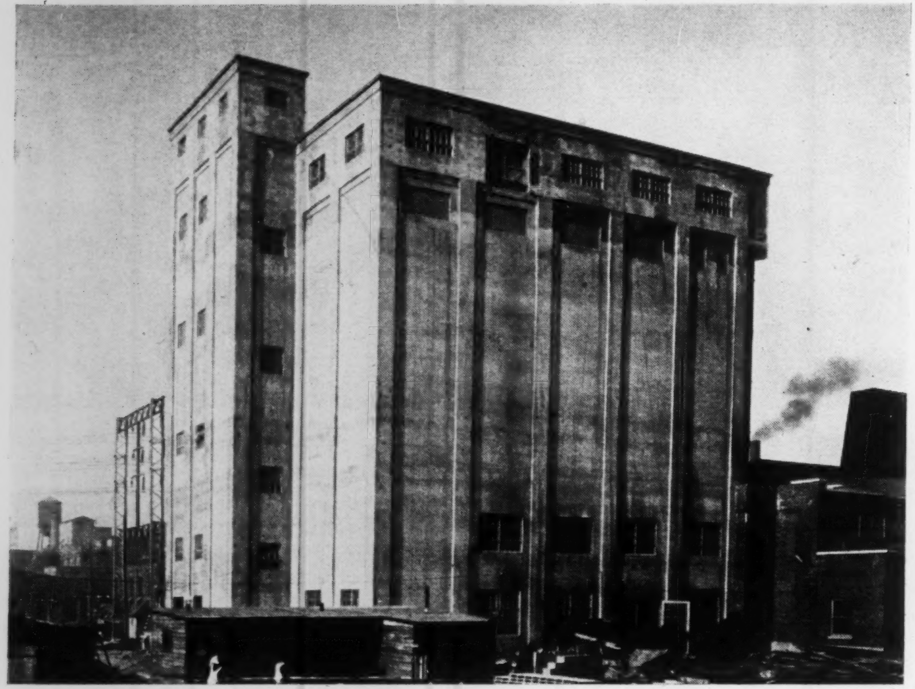

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1942, pp. 532–534. Results of experiments conducted in Sanitary Engineering Research Laboratory, New York University, in effort to determine possible methods of treatment of waste with high oil and grease content.

INSTITUTIONAL TREATMENT PLANTS. Institutional Sewage Treatment and Water Supply, H. R. Green. *Pub. Works*, vol. 74, no. 4, Apr. 1943, pp. 11–15 and 40–41. Designing such plants demands consideration of features that differentiate them from municipal ones; illustrative example of water supply and sewage treatment for Iowa Institution, given; water supply; capacity of plant; general conditions; description of water plant; sewage treatment plant; control building.

REFUSE DISPOSAL IN ARMY. Army Tries Garbage Disposal by Grinding, R. N. Clark and A. Heifetz. *Pub. Works*, vol. 74, no. 3, Mar. 1943, pp. 21 and 38. Garbage at isolated island army posts, where hog feeding and sanitary fill are impracticable, is ground fine and discharged by sewer into tide water.

SEWAGE DISPOSAL, GREAT BRITAIN. Sewerage and Sewage Disposal in 1942. *Surveyor*, vol. 102, no. 2665, Feb. 19, 1943, pp. 83–84. Review of activities, including wartime research; sedimentation processes; biological filtration investigations; sludge as manure; future policy.

SEWAGE FILTERS. Biology of Sewage Sprinkling Filters, R. H. Holtje. *Sewage Works J.*, vol. 15, no. 1, Jan. 1943, pp. 14–29. Composition and activity of organisms concerned in filter bed operations; occurrence and characteristics of bacteria, fungi, algae, protozoa, nematoda, rotatoria, chaetopoda, crustacea, arachnida, and insects.

SEWAGE TANKS. Final Settling Tanks of Novel Design, R. H. Gould. *Water Works & Sewerage*, vol. 90, no. 4, Apr. 1943, pp. 133–136. In 1942, facilities for secondary treatment were placed in operation of Bowery Bay Sewage Treatment Works in New York City; new units included unusual design features believed to be novel; flows treated are over 80% of designed capacity of facilities; aeration tank design and operation; final settling tanks described; operating results and flow observations.

SEWAGE TANKS, WOOD. Wood Imhoff Tanks Serve Army Camp. *Eng. News-Rec.*, vol. 130, no. 14, Apr. 8, 1943, pp. 490–492. Constructed entirely of wood, battery of 9 Imhoff-type settling tanks, with capacity of 3.8 mgd, are in use at army sewage disposal plant; design permitted elimination of critical materials and resulted in speedy construction.

SEWERS, CONSTRUCTION. Suspending Seventeen Hundred Feet of Sewer from Bridge. *Pub. Works*, vol. 74, no. 5, May 1943, p. 39. Danville, Ill., Sanitary District, extended sewer system into South Danville, which lies across Vermilion river; 10-in. corrugated pipe was used, set to uniform grade by use of hangers especially designed for purpose and of various lengths, and braced against wind loads.

SEWERS. Danville Builds Corrugated Pipe Sewer 100 Ft Above Vermilion River, J. E. Epler. *Highway Mag.*, vol. 34, Mar.-Apr., 1943, pp. 32–34. Illustrated description of pipe sewer installed over Vermilion River; Armco corrugated metal pipe used in various parts of sewer lines; long pipe lengths and special hangers aid in installing aerial sewer quickly.

SLUDGE. Controlled Heat and Mixing Improve Stage Digestion, C. P. Gunson. *Sewage Works Eng. & Mun. Sanitation*, vol. 14, no. 1, Jan. 1943, pp. 20–21. Denver sewage disposal plant has changed method of transfer of raw sludge to digester tanks and raised temperature in digesters; by careful observation and proper control supernatant liquor now averages 1/2 of 1% solids instead of 2% previously experienced.

SLUDGE. Anaerobic Digestion—II: Nitrogen Changes and Losses During Anaerobic Digestion, J. R. Snell. *Sewage Works J.*, vol. 15, no. 1, Jan. 1943, pp. 56–70. Article presents results of author's experiments and reviews literature on same subject, explaining some of many inconsistencies that appear; attempt made to answer question: "are nitrogenous gases evolved during anaerobic digestion and, if so, under what conditions?" Bibliography.

SLUDGE. Sludge Compacting, W. Rudolfs and R. P. Logan. *Sewage Works Eng. & Mun. Sanitation*, vol. 14, no. 1, Jan. 1943, pp. 10–12. Report on research of New Jersey Agricultural Experiment Station on rate of sludge compaction in given time under varying temperature conditions; statistics and charts of experimental work, showing effect of initial concentration, time, and temperature, are given.

WATER POLLUTION. Sewage, Algae and Fish, F. J. Brinley. *Sewage Works J.*, vol. 15, no. 1, Jan. 1943, pp. 78–83. Paper shows that treated domestic sewage acts as fertilizer for stream in much the same manner as barnyard fertilizer or manure does for field plants; while making biological survey of Ohio River watershed author was able to collect large amount of data on relation of domestic sewage to aquatic life. Paper is based upon data presented in detail in supplement of forthcoming report of Ohio River Pollution

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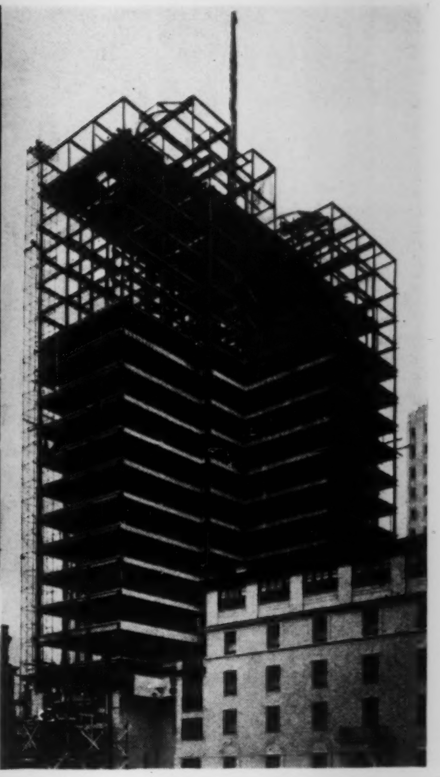

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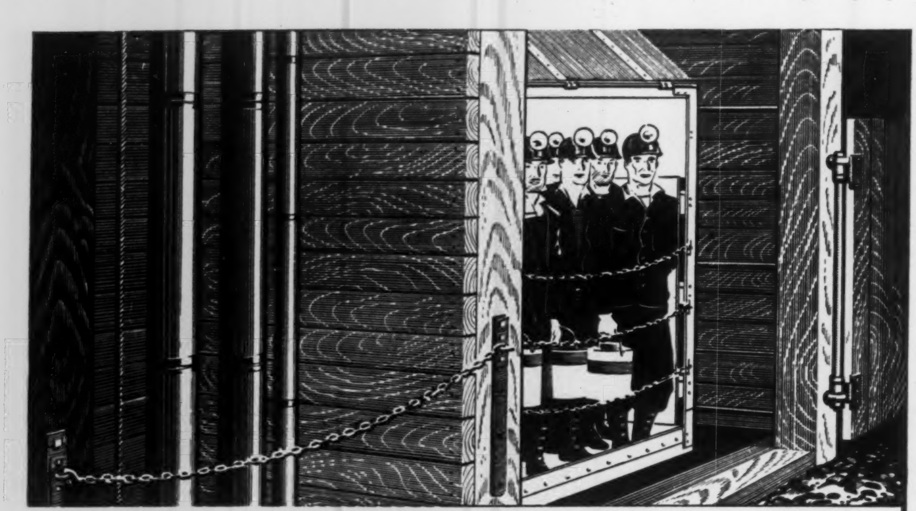

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Survey, by F. J. Brinley and L. I. Katzin. Report of Biological Studies. In press.

WATER POLLUTION, CALIFORNIA. Shore Pollution Reduction at San Francisco, C. G. Hyde. *Sewage Works J.*, vol. 15, no. 1, Jan. 1943, pp. 3–13. Attempt made to indicate sewerage improvements which have recently been made in San Francisco to state immediate purpose thereof and to show what results have been achieved; history of sewage conditions and improvements; use of shores and beaches; investigations of shore water conditions; improvement in bacteriological and other conditions; discussion of bacteriological findings; physical conditions of shores. Bibliography.

STRUCTURAL ENGINEERING

AIR RAID PRECAUTIONS, SHELTERS. Bomb-Resistant Air Raid Shelters, H. E. Wessman. *Am. Concrete Inst.—J.*, vol. 14, no. 4, Feb. 1943, pp. 241–250. Problems involved in structural design of two types of bomb-resistant shelters are outlined and inadvisability of any large program of shelter construction in United States is emphasized; plea and suggestion for better outside walls for future buildings are made.

BEAMS AND GIRDERS, CONCRETE-WOOD. Oregon Tests on Composite (Timber-Concrete) Beams, C. B. McCullough. *Am. Concrete Inst.—J.*, vol. 14, no. 5, Apr. 1943, pp. 429–440. Tests were prompted by desire of Oregon State Highway Dept. to develop short-span highway bridge intermediate in cost between untreated timber trestle and reinforced concrete viaduct; important conclusions is that ultimate strength of composite beam (of type tested), suitably designed, is at least twice that for same materials and same dimensions independently employed.

BEAMS AND GIRDERS, CONTINUOUS. Analysis of Continuous Frames Containing Members with Variable Moment of Inertia, K. H. MacKinlay. *Instn. Engrs. Australia—J.*, vol. 15, no. 1, Jan. 1943, pp. 3–12. Author provides foundation connecting selected beam constants, with bending moments on beam; from basic equations, expressions are built up for fixed-end moments on span, for any loading; expression for distribution of moment applied at joint, and for "carry over factor" for moments at remote ends of connecting members.

BEAMS AND GIRDERS, STRESSES. How to Analyze Continuous Beams for Combined Dead and Live Loading, J. Zalkin. *Eng. News-Rec.*, vol. 130, no. 14, Apr. 8, 1943, pp. 486–489. Rapid procedure in using Hardy Cross method in analyzing continuous beams for critical live loading plus dead load is outlined; how method is applied is illustrated step-by-step for 5-span design to obtain maximum positive and negative moments and maximum shears; method for preparing moment diagrams and obtaining points of inflection.

BEAMS AND GIRDERS, WOODEN. Glued Wood Beams Replace Critical Steel for 67-ft Span. *Construction Methods*, vol. 25, no. 2, Feb. 1943, p. 39. Laminated wood beams 67 ft 2 in. long delivered by logging truck to Seattle housing project, are made up of glued and nailed dimension lumber; they have 40-in. depth and 14-in. width and are built with 3-in. camber.

CHIMNEYS, DESIGN. Method of Design of Steel Stacks and Foundation, S. Levine. *Petroleum Refiner*, vol. 22, no. 4, Apr. 1943, pp. 116–117. To illustrate principles and methods of design, they are applied to practical problem worked on by author; mathematical solution of problem, dealing with wind pressure, overturning moment caused by wind load, and soil pressures; design of reinforcing steel for footing, and bolts remain matter of application of standard formulas and tables.

HOUSES, WELDED STEEL. Designs and Constructional Data for Steel Framed Houses Using Arc Welding Process, B. Osman. *Sheet Metal Industries*, vol. 17, nos. 192, 193, Apr. 1943, pp. 681–690, and May, pp. 867–873. Problem examined from viewpoint of welding engineer; object of paper is to advance design of steel-framed house, principle of which can be applied to residence of almost any capacity. From winning paper submitted in content for James F. Lincoln Arc Welding Foundation.

LUMBER HANDLING. Moving Timbers in Fabricating Yard. *Eng. News-Rec.*, vol. 130, no. 12, Mar. 25, 1943, pp. 428–429. Timber truss frames weighing 14 tons each, which had to be fabricated for special naval purposes, required unusually large and heavy timber members; to move these timbers to saws, to framing platforms, and to assembly areas, combination of truck cranes, roller conveyors, skids, and guy derricks was successfully used.

SHIPBUILDING, WELDING. Control of Welding in Shipbuilding, L. M. Grover. *Welding J.*, vol. 22, no. 4, Apr. 1943, pp. 227–238. Critical points in cargo ship from viewpoint of welding; significance of extreme fibers in sections subjected to bending; materials; shrinkage stresses and load stresses; notch effects and other stress raisers; degree of restraint and rigidity; amount of welding and its disposition; fit-up and preparation of edges for welding; welding procedure and sound welds.

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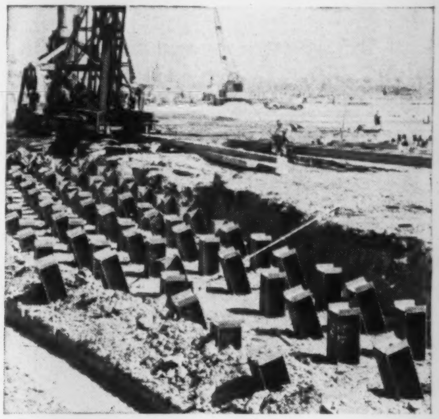

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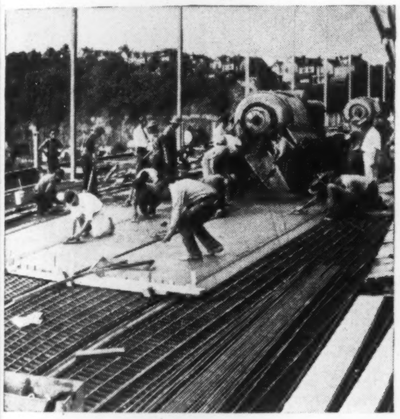

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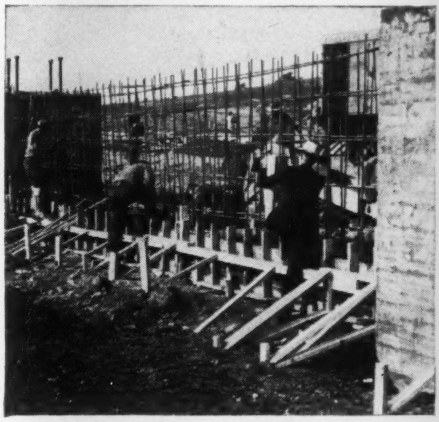

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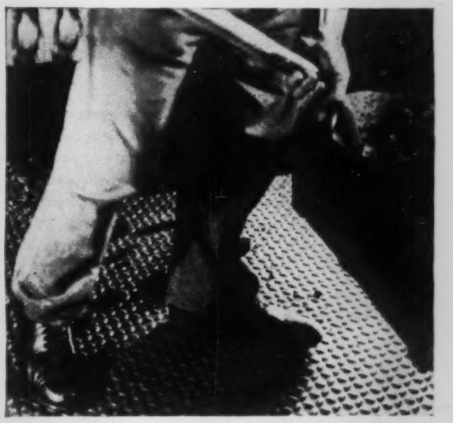

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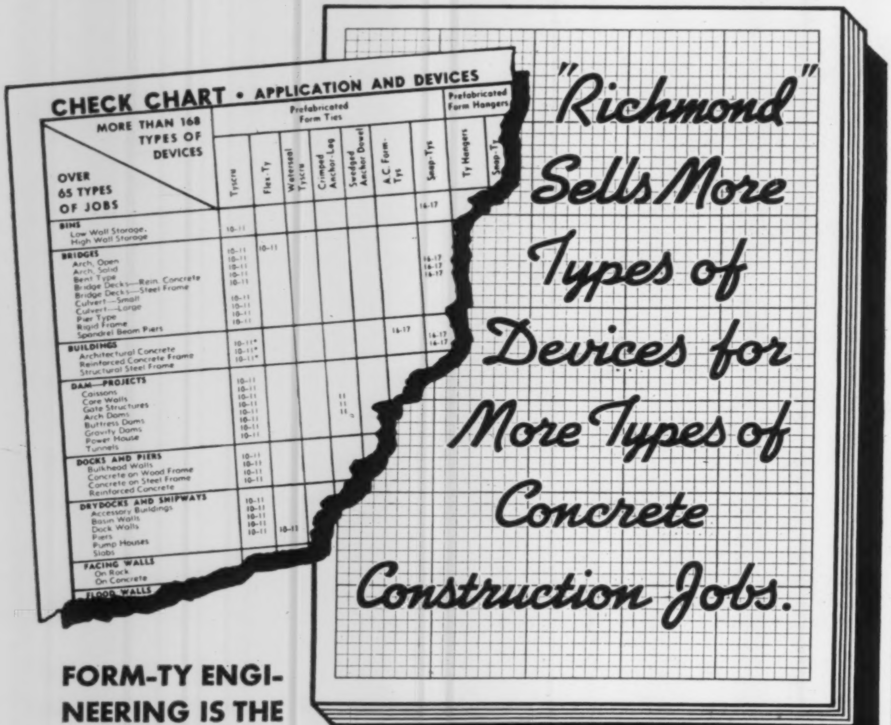
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WOODEN CONSTRUCTION. Fabrication of Laminated Timber Members. V. Ketchum. *Eng. J.*, vol. 26, no. 2, Feb. 1943, pp. 58–61. Wooden beams with spans as great as 70 ft, and wooden trusses as long as 200 ft, are possible through use of glued laminated construction; principles employed in design and manufacture of built-up units are described. Before joint meeting Am. Soc. Civ. Engrs. and Eng. Inst. Canada.

WOODEN CONSTRUCTION. Some Fundamentals of Timber Design, H. J. Hansen. *Tex. Agric. & Mech. College—Eng. Experiment Station—Bul. No. 66*, vol. 13, no. 5, 4th Series, May 1, 1942, 76 pp. Characteristics influencing design; use of working stresses; control of effects of shrinkage; fastenings; beams; columns; members with combined bending and axial loads; glued laminated construction.

SURVEYING

AERIAL ALCAN HIGHWAY. Aerial Location on Alcan Highway, K. H. Siddall. *Better Roads*, vol. 13, no. 3, Mar. 1943, pp. 14–17. Demand for rapid completion of route met by using aerial photographs to establish control points and project most advantageous line.

TRAFFIC CONTROL

HIGHWAY TRAFFIC SIGNS, SIGNALS, AND MARKINGS. El Senalamiento de la Velocidad Segura en Los Caminos, N. Alurralde. *Caminos*, vol. 9, no. 48, Nov.-Dec. 1942, pp. 283–290. Signalling of safe speeds on highways; analysis of factors that influence safe speeds on curves; effect of uncalibrated speedometers; effect of rough, slightly rough, and smooth pavement surface on safe speed; relation between safe speed, coefficient of friction, and reading of indicator; safe speeds on curves at night; legal speed limits and safe speeds to be indicated; application of system to Argentine roads; examples of markings.

TUNNELS

CONSTRUCTION. Mont Cenis Tunnel Doomed Hand Drilling, C. H. Vivian. *Compressed Air Mag.*, vol. 48, no. 3, Mar. 1943, pp. 6978–6981. Historical review of construction of tunnel 42, 157 ft long, 26 ft 3 in. wide, and 24 ft 7 in. high; this tunnel was first connecting link between railroad systems of France and Italy; work started Aug. 18, 1857, and first trains ran through it in 1871; use of compressed air drills.

RAILROAD, LINING. No Delays to War Traffic on This Tunnel Repair Job. *Highway Mag.*, vol. 34, May-June 1943, pp. 66–69. How Pittsburgh & West Virginia Railroad solved problem of restoring 300-ft failure in section of concrete lining of important double-track main line tunnel by installing liner plates. Previously indexed from *Ry. Age*, Dec. 5, 1942.

VEHICULAR, NETHERLANDS. Highway Road Tunnel Under Maas, Rotterdam, K. W. Mautner. *Structural Engr.*, vol. 21, no. 2, Feb. 1943, pp. 43-65. Complete illustrated description of layout and construction procedure of tunnel designed for completion in 1941; details of foundations and substructure of ventilator buildings; sinking tunnel caissons.

VEHICULAR, NEW YORK CITY. Progress Report Narrows Tunnel. New York City Tunnel Authority, 200 Madison Ave., New York, Mar. 3, 1943, 21 pp. Report on proposed tunnel under New York Bay between Boroughs of Brooklyn and Richmond; plans presented; estimated tunnel traffic; recommended route; types of structures; cost of construction and operation; time required for planning and building.

WATER SUPPLY. Wellpoints De-water Tunnel, J. F. Geary. *Western Construction News*, vol. 18, no. 2, Feb. 1943, pp. 53–54. Driving of open-tunnel through water-bearing sand, in connection with sea-water pumping project in southern California, was simplified by use of wellpoints jetted below tunnel line through pre-cut holes in steel liner plates.

WATER RESOURCES

MILITARY ENGINEERING, WATER SUPPLY. Water Supply and Water Purification. *U.S. War Dept.—Tech. Manual No. 5–295*, 1942, 309 pp. Purpose of this manual is to provide technical information concerning water supply and water purification and to assist engineer troops in fulfilling their water supply functions; it discusses those basic principles of water supply and water treatment that pertain to both civilian and military practice and, in addition, expedients necessary in the field.

UNDERGROUND. Les Nappes aquiferes souterraines et leur Utilisation, J. W. Simard. *Revue Trimestrielle Canadienne*, vol. 29, no. 113, Mar. 1943, pp. 1–18. Underground water-bearing strata and their utilization; origin and quality of ground waters; flow of underground water; development of well; electric pump sets; wells in series.

UNITED STATES. Significance of Chemical Requirements of New Drinking-Water Standards, N. J. Howard. *Water & Sewage*, vol. 81, no. 3, Mar. 1943, pp. 17 and 41–43. Physical and chemical characteristics included in revised standards for drinking water, recently released by Public Health Service of United States.

WATER TREATMENT

CAMPS, MILITARY. Water Supply for Army Camps and War Factories. *Engineer*, vol. 175, no. 4551, Apr. 2, 1943, pp. 277–278. Main features of instructions given by Engineer Department of U.S. Army, as to investigation of sources of supply, distribution of water, and necessary treatment for softening, purification or other purposes.

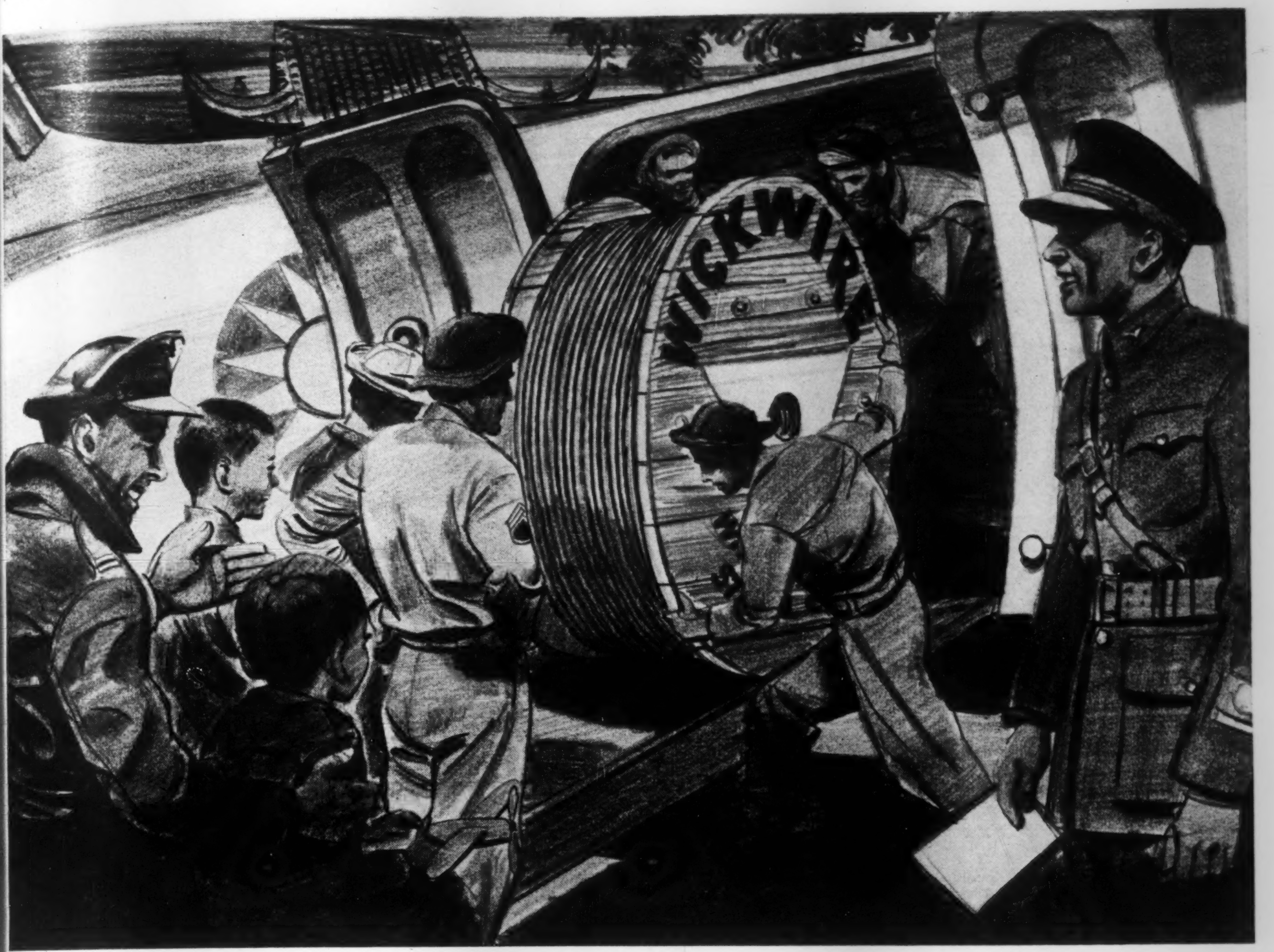
CHLORINE. Chlorine—Critical Material Solves Critical Problem, L. A. Jackson and W. A. Mayhan. *Water Works & Sewerage*, vol. 90, no. 4, Apr. 1943, pp. 113–118. Manner in which Little Rock Municipal Water Works, Little Rock, Ark., reestablished design capacity of vital supply line; in 1 year of operation, capacity of vital flow line was reduced 20% by organic growth which could have been prevented had sterilization facilities at head of supply line been included in original design; from 3 years of experience "break point" superchlorination has proved most effective treatment.

CHLORINATION. Operation of Chlorinators During Winter Season, R. M. Harris. *Water Works Eng.*, vol. 96, no. 1, Jan. 13, 1943, pp. 36-37; see also *Water & Sewage*, vol. 81, no. 1, Jan. 1943, pp. 9–10. Practical suggestions for increasing efficiency of chlorination during cold temperature periods. From publication of Washington State Dept. of Health.

CHLORINATION. Chlorination—Routine and Emergency, C. R. Moore. *Water Works & Sewerage*, vol. 90, no. 3, Mar. 1943, pp. 99–100. Portland water district has well trained chlorinating crew available at all times, ready to apply knowledge and training to actual performance of this important phase of water works operation; typical case cited. Before Maine Water Utilities Assn., Portland, Me.

FILTRATION PLANTS. Deflector Surface Wash System, E. A. Bartz. *Pub. Works*, vol. 74, no. 4, Apr. 1943, pp. 23–24. Details of system as developed and installed on Two Rivers filtration plant, Two Rivers, Wis., using spray nozzle adapted from sewage plant operation.

FILTRATION PLANTS, HAMILTON, ONTARIO. Overcoming Plankton Difficulties at Hamilton Filtration Plant, D. H. Matheson. *Water & Sewage*, vol. 81, no. 4, Apr. 1943, pp. 38, 68, and 70. Hamilton, Ontario, filtration plant has just completed 10 years of operation in supplying water that is safe, clear, and palatable; paper is summary of experiences in handling treatment of water and producing effluent which is always in accordance with specifications mentioned. Before Am. Water Works Assn.



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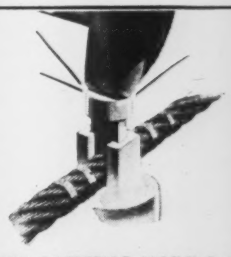

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FILTRATION PLANTS. Village Supply Treated by Pressure Filter Plant, R. M. Grieve. *Water Works Eng.*, vol. 96, no. 6, Mar. 24, 1943, pp. 296–298. Design of compact plant at Richmondville, N.Y., kept down cost of construction, operation, and maintenance; turbidity high in spring; meter controls chemical feeders; carbon applied as split treatment; setting tanks outside building; pressure filters, filter media, and building described; operating results; cost data on pressure filter plant.

FILTRATION PLANTS, NEWPORT NEWS, VA. New Filtration Plant of Newport News, Va., R. Newsom. *Water Works & Sewerage*, vol. 89, no. 12, Dec. 1942, pp. 501–510. Description of Harwood's Mill Filter Plant of Newport News Waterworks; plant comprises four 1.5-mgd reinforced concrete filters, 1,000,000 gal of settling basin capacity, 450,000 gal of clear well capacity, and 150,000 gal of wash water standpipe; pumping plant includes three low lift pumps and three high lift pumps.

FILTRATION PLANTS, OPERATION. Operating Results at Windsor Filtration Plant, G. H. Strickland. *Water & Sewage*, vol. 81, no. 4, Apr. 1943, pp. 39, 62, 64, and 66. Windsor has been faced with problems in regard to water treatment and consumption; record of performance presented which indicates solutions to problems stated. Before Am. Water Works Assn.

FILTRATION, PORTABLE EQUIPMENT. Shofu Cylinder, R. D. Kirkpatrick. *Military Engr.*, vol. 35, no. 209, Mar. 1943, p. 113. Description of Japanese equipment found on Guadalcanal; filter is contained in cylinder $2^1/_2$ ft high by 18 in. in diameter weighing 150 lb; impure water flows into metal chamber where pressure forces it through porous clay; same heat forces clear water out through faucet at maximum rate of 4 gal per min.

LABORATORIES. Significance of Laboratory Examinations, A. E. Berry. *Eng. & Contract Rec.*, vol. 56, no. 14, Apr. 7, 1943, pp. 38–40 and 57. Important place of research laboratory in water works and in field of sanitation; laboratory facilities; submission of samples; frequency of sampling; minimum sampling; chemical analyses; methods of examination; expression of results; bacteriological expressions; standards of quality; note on standards prepared under direction of U.S. Public Health Service for use in determining suitability of water on common carriers; recent Dominion standards.

LAWRENCE, MASS. Treatment Plant Results at Lawrence, Mass., N. N. Wolpert. *Water Works Eng.*, vol. 96, no. 7, Apr. 7, 1943, pp. 344–346. Plant, placed in service in 1938, was designed for 10 mgd, although normal load has been 8 mgd; it supplies water to Lawrence, city of 85,000 population, and to Methuen, community of 26,000, which uses 857,000 gal per day; filtration plant and equipment; carbon added and stabilizes sludge; taste-and-odor troubles.

PAPER AND PULP MILLS. Conservation in and by Chlorination, R. B. Martin. *Paper Trade J.*, vol. 116, no. 18, May 6, 1943, pp. 31–34. Ways in which pulp and paper industry's chlorine is increasing production of war materials; curtailment in use of chlorine in paper industry has released supply for war processes; general industrial chlorination; power plants; oil refineries and gasoline plants; compressors; refrigeration, and air conditioning; metals, rubber, chemicals, and war production; raw and processed foods; process industries; chemical processes—chlorine metering. Bibliography. Before Tech. Pulp & Paper Industry.

PUBLIC WATER SUPPLIES. Modern Methods of Disinfecting Public Water Supplies, N. J. Howard. *Eng. & Contract. Rec.*, vol. 56, no. 14, Apr. 7, 1943, pp. 41–43, and 54–55. While chief processes more commonly employed consist of chlorination, chloramination, and ozonation, reference is also made to other methods occasionally employed.

QUALITY OF WATER, NEW YORK CITY. Effects of Changes in Water Quality in New York City, F. E. Hale. *Water Works Eng.*, vol. 96, nos. 1 and 3, Jan. 13, 1943, pp. 12–16, and Feb. 10, pp. 152–156 and 168–171. Review of early epidemics due to water supply in New York City and subsequent establishment of laboratories to control water quality; laboratory history since 1897, giving vast amount of pertinent water supply data and analytical studies made to improve water supply.

STRAINING. Strainer for Sea Water and Ammoniacal Liquor as Well as River, Lake, Canal, and Well Water, S. P. Kinney. *Blast Furnace & Steel Plant*, vol. 31, no. 2, Feb. 1943, p. 223. Brief illustrated description of Brassert self-cleaning water strainer, built of special materials for use in straining seawater, and also for service at coke and similar plants for straining ammoniacal liquor.

TASTE AND ODOR REMOVAL. Improved Technique in Taste and Odor Control at Toronto, N. J. Howard. *Water & Sewage*, vol. 81, no. 4, Apr. 1943, pp. 36, 60, and 62. City of Toronto has three water-purification plants in operation with total capacity of approximately 200 million imperial gal daily, each plant operating as separate unit; paper discusses effect of water quality upon operating results at Toronto plants during year 1942, and in this connection emphasizes value to minicipality of close laboratory control. Before Am. Water Works Assn.

TREATMENT PLANTS, Flint, Mich. Treatment at Flint, N. N. Wolpert. *Water Works Eng.*, vol. 96, no. 4, Feb. 24, 1943, pp. 198–201. Description of Flint plant, chemical treatment followed and results obtained; taste and odor provide main problem; activated carbon used continuously.

WATER CHLORINATION. Notes on Control of Chlorination, A. R. Vail. *Water & Water Eng.*, vol. 46, no. 562, Mar. 1943, pp. 102–106. Water sources; need for sterilization; chlorination; control of chlorination; residual chlorine tests; operation. Before Instn. Water Engrs.

WATER POLLUTION. Studies in Stream Pollution, G. A. H. Burn. *Eng. & Contract. Rec.*, vol. 56, no. 14, Apr. 7, 1943, pp. 50–53 and 55–56. Effect of municipal water supply and sewage disposal problems; uses of water; self purification; methods of abating pollution; measure of pollution load; legislative control of pollution; studies in stream pollution; standards of water cleanliness necessary; classification of waters; standards in relation to use.

WATER SOFTENING. St. Paul Likes Soft Water, L. N. Thompson. *Am. City*, vol. 58, no. 4, Apr. 1943, pp. 45–46. Illustrated description of water-softening plant put into operation by St. Paul Water Department.

WICHITA, KANS. Treating Water at Wichita, Kans., C. E. Patrick. *Water Works Eng.*, vol. 96, no. 1, Jan. 13, 1943, pp. 19–20. Description of plant designed to care for population of about 200,000; supply is from 25 wells ranging from 80 to 260 ft deep and spaced minimum distance of half a mile apart; water is pumped to surface by electrically driven duplicate well turbine pumps, 22 of which have capacity of 1,000 gal per min and 3 of which can handle 500 gal per min.

WATER WORKS ENGINEERING

ARGENTINA. Obras de Provision de Agua Al Partido de Avellaneda, H. Albertelli. *Boletin de Obras Sanitarias de la Nacion*, vol. 7, no. 67, Jan. 1943, pp. 510–520. Water works for city of Avellaneda and suburbs, in Province of Buenos Aires, Argentina; original holder of concession transferred it to British company; of 21 wells drilled, 16 were retained in service; diesel and electric deep well pumps; storage tanks; distribution system; water rates; at end of 60-year concession, title passes to municipality.

ARGENTINA. Saneamiento de la Ciudad de Curuzu Cuatia, O. J. P. Cantaluppi. *Boletin de Obras Sanitarias de la Nacion*, vol. 6, no. 66, Dec. 1942, p. 430. Sanitation of city of Curuzu Cuatia, Province of Corrientes, Argentina; water works under construction; of city area of 575 hectares, some 100 hectares laid out in city blocks, with about 7,000 inhabitants; 5 semi-artesian wells; pumping plant; distribution mains; 1,200 service connections planned.

CRESTON, IOWA. Creston, Iowa, Bought Water Works, Doubled Capacity and Eliminated Shortage, J. B. Russell. *Pub. Works*, vol. 74, no. 5, May 1943, pp. 14–15. Six months' scarcity of water due primarily to unfriendly public relations with water company; problems solved by purchase of water property by city and doubling capacity of reservoir; concrete spillway at Summit Lake repaved; details of project.

FLINT, MICH. Practices in Use at Flint, Mich., N. N. Wolpert. *Water Works Eng.*, vol. 96, no. 2, Jan. 27, 1943, pp. 55–56. Description of practices followed by water department in installing and operating its distribution system, and carrying out its maintenance work.

TANKS, WOODEN. Water-Storage and Sewage-Treatment Tanks Built of Wood to Conserve Essential Water Materials, H. Harvey. *Water & Sewage*, vol. 81, no. 2, Feb. 1943, pp. 12–13. Details of assembly of 200,000-gal tanks of timber construction; tongue and grooved work staves are turned to horizontal position and bent around tank to act as tension bands, doing work formerly done by steel rods; staves, on edge, bent around wood stiffeners, were joined with wood splice plates and ring connectors.

TOLEDO, OHIO. Toledo Water Supply. *Engineer*, vol. 175, nos. 4544, 4545, 4546, Feb. 12, 1943, pp. 136–138; Feb. 19, pp. 146–149; Feb. 26, pp. 164–165. New system is composed of nine major features: intake crib in Lake Erie 2.5 miles offshore; large conduit that connects intake crib with low service pumping station; Lake Erie pipe line; filtration plant furnishing 80 million gal per day; covered concrete reservoir; high service pumping station; elevated storage tank of 1 million gal capacity; and 7 miles of high service trunk lines.

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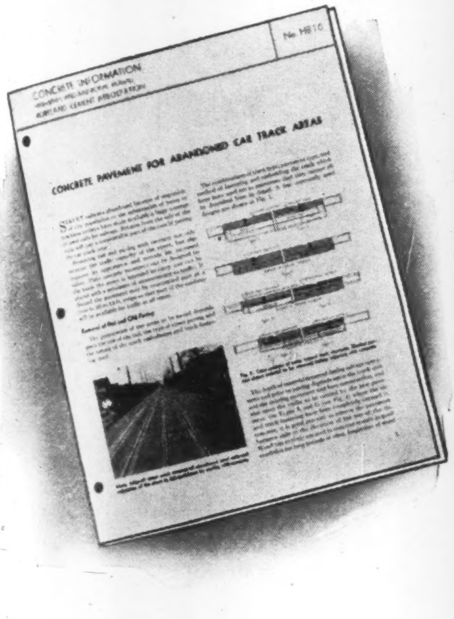

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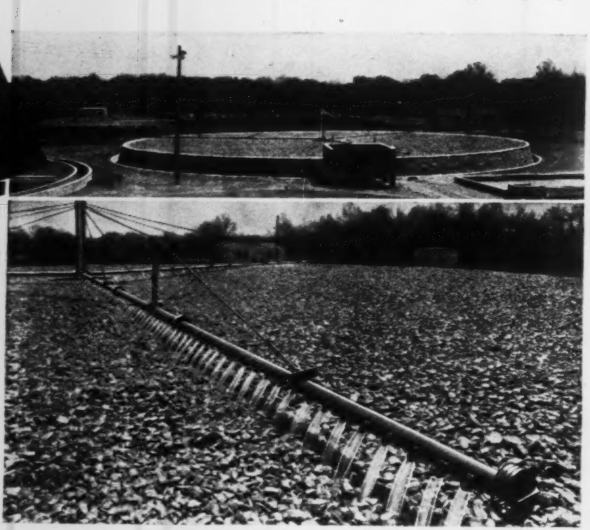

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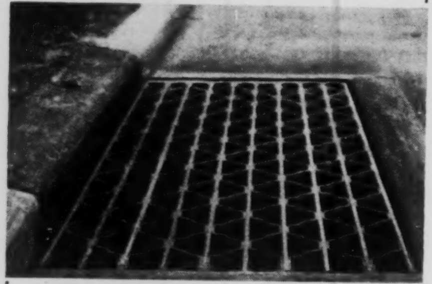

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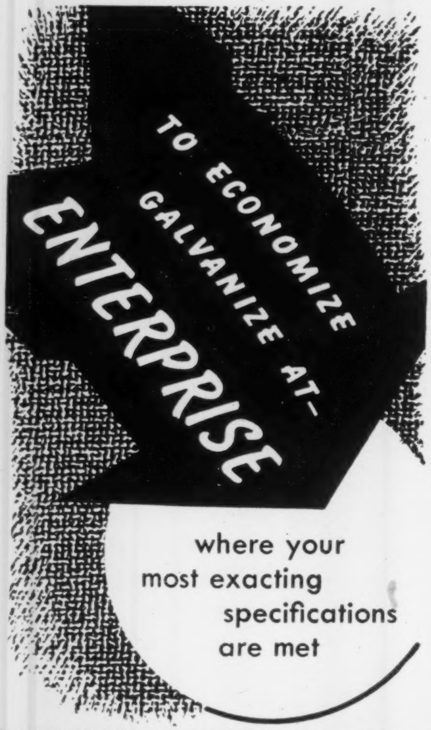

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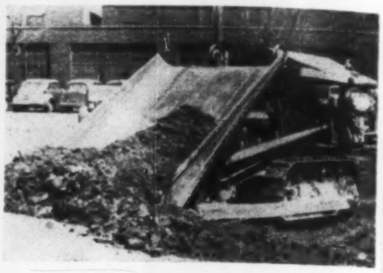
New Mobiloader

An improved Athey Mobiloader which operates with the Caterpillar Diesel D4 Tractor is announced by Athey Truss Wheel Co.

Although simplicity in design is the chief change, the manufacturer states, there are numerous improvements over its predecessor model which has been in the field for four years. The new model has increased stability, greater operating range, reduced height to simplify transportation, and lower center of gravity. It has a bucket capacity of $1^1/_8$ cu yds.



Athey Mobiloaders, made in sizes to fit Caterpillar D8 and D4 Tractors, are characterized by their "straight line" loading action. Digging the load at the front, the outfit travels in reverse to the truck or fill and discharges the material overhead. Full information on the new Model W4–1 may be had by writing your Athey-Caterpillar Dealer, or Athey Truss Wheel Co., 5631 W. 65th St., Chicago, Ill.

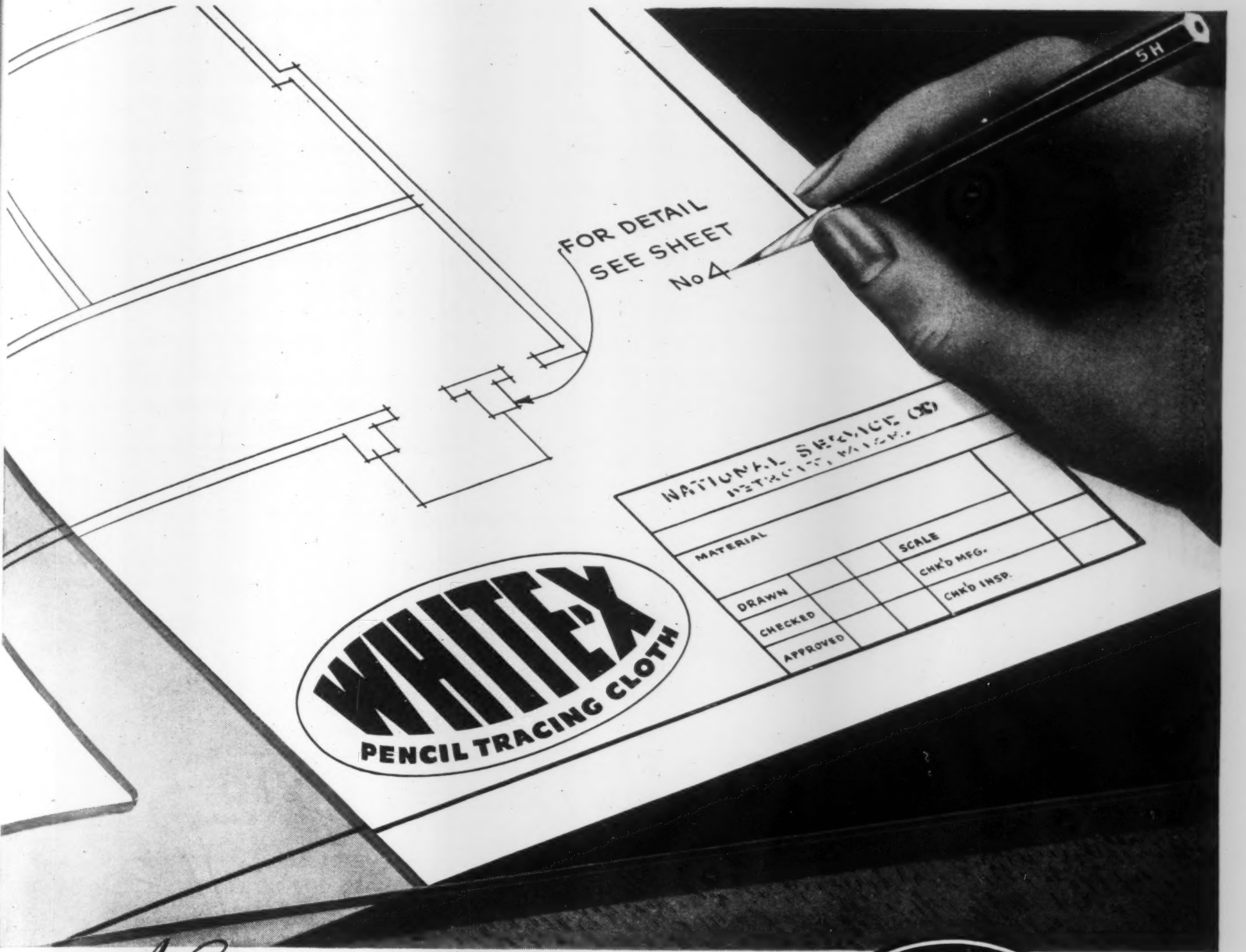
Ship Frame Bender

An improved portable ship frame bender, manufactured by the Watson-Stillman Company, Roselle, N.J., is particularly adaptable for shipyards during the present wartime emergency. Its distinct feature is the new overhead swivel connection to the power source, thus eliminating the involved hose connection to a central accumulator. The machine, mounted on wide, swivel-mounted castors, can be moved easily.

The machine is completely enclosed and self-contained, including a 2-hp D.C. or 3-hp A.C. motor producing either 3.3 or 5 gal per min, using hydraulic medium oil. The entire unit measures 2 ft 7 in. from handle to handle, with an over-all height of the same dimensions. The piston, having a $6^1/_2$-in. diameter, is provided with cast-iron piston rings. The ram, 5 in. in diameter, has a stroke of 10 in. The machine weighs 1,100 lb.

A New Hot Poured Joint

Known to the trade as Para-Plastic, this compound is a substitute for the former Hot Poured Rubber Sealing Waterproof Compound. While Para-Plastic substitute has been developed with non-critical materials (containing no rubber), the sealing qualities conform fully with Federal Specifications SS-F-336 covering a hot poured sealing compound.



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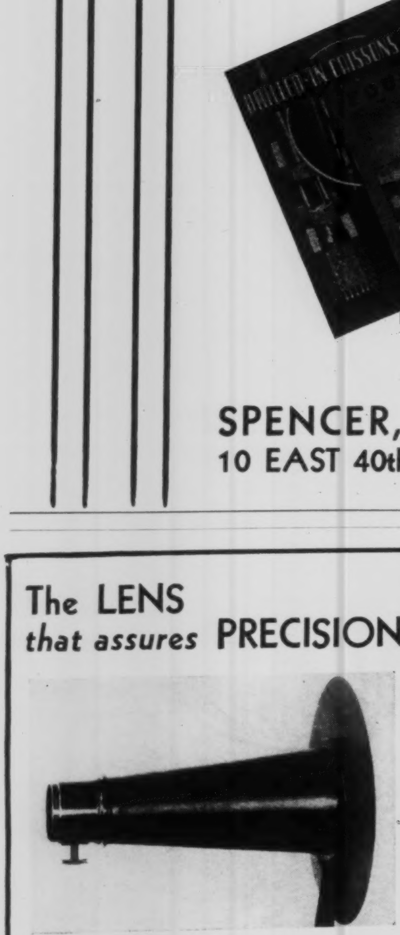

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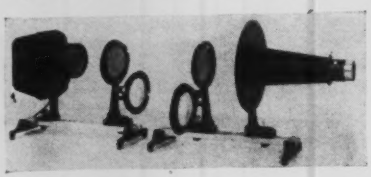

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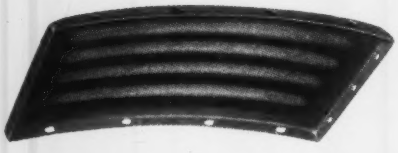

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A sixteen-page catalog describes and lists stock sizes, and pictures many installations. E. K. Geyser & Co., 200 Cedarhurst St., Pittsburgh, Penna.

New Electrode Index

A NEW ELECTRODE COMPARISON CHART published by Air Reduction Company helps to simplify buying of competitive welding electrodes. The chart details the principal A.W.S. and A.S.T.M. electrode classifications and indicates which electrodes produced by twenty leading manufacturers meet the different requirements. The buyer can use this chart to determine what brands of electrodes fall within a specified A.W.S. and A.S.T.M. category, as well as to learn what alternate brands might be used successfully should a specified electrode not be available.

Free copies of this helpful comparison chart may be secured by writing to Mr. G. Van Alstyne, Air Reduction, 60 East 42nd St., New York 17, N.Y.

Literature Available

CLEAN, DRY AIR—A new 8-page bulletin, No. 543, just released by the Logan Engineering Co., 4900 Lawrence Ave., Chicago, Ill., points out the high costs and loss in man-hours resulting from moisture and dirt in compressed air lines. How the Aridifier, made by this company, cleans and dries compressed air by centrifugal force is graphically shown. The placement of the compact, cast units in the line is described, and complete specifications are given for sizes from $^{3}/_{8}$ in. to 10 in.

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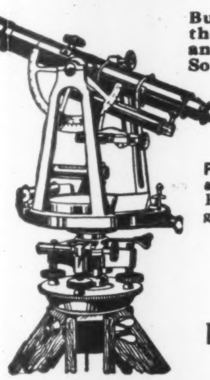

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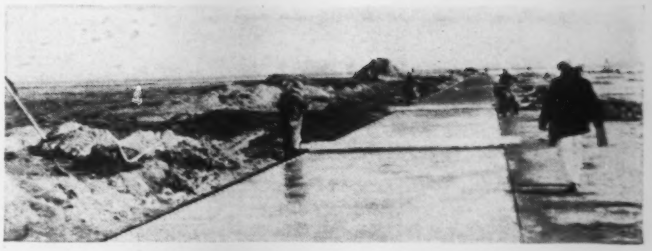

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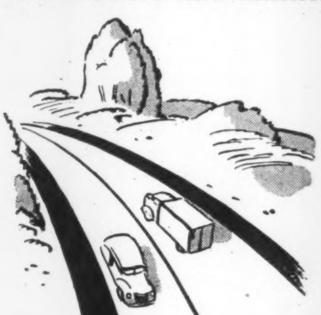

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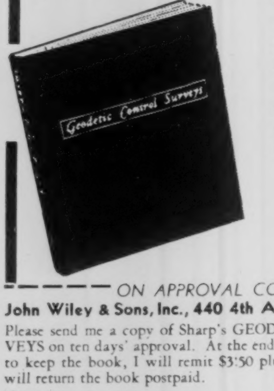

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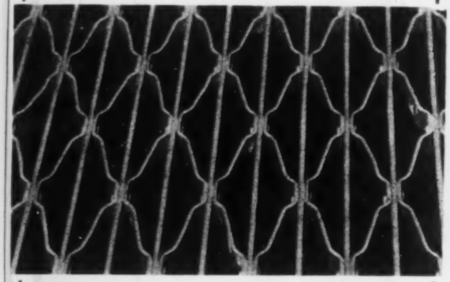

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CONCRETE AND MORTAR—A "Manual for Concrete and Mortar Computations" is available on request to the North American Cement Corp., 41 E. 42nd St., New York 17, N.Y.

CONCRETE PLACEMENT—A 164-page manual and handbook of concrete placement by means of pump and pipeline is available to contractors, engineers, estimators and operating men. One chapter is devoted to general Pumpcrete placing methods, placing costs are discussed with figures and estimates for a number of actual cases. Other subjects covered are: proper distribution methods; the mixing plant for production of concrete; pumpable concrete with field corrections to mixes and instructions for pumping under unusual conditions; and about one-half of the volume is filled with descriptions of actual jobs. Copies are available by writing Chain Belt Company, Milwaukee, Wis.

HARD FACING—This is the title of a booklet describing the many opportunities for increasing the life of wearing tools and parts by the application of a wear-resistant hard metal facing. Coast Metals, Inc., Canton, Ohio.

PUMPS—A new 20-page booklet on vertical axial and mixed-flow pumps, Form 7073, has been announced by Ingersoll-Rand Co., 11 Broadway, New York, N.Y. The units described are designed for pumping large volumes of liquid at comparatively low heads. They are available in a complete range of sizes for capacities to 75,000 gal per min and for heads to 100 ft per stage. These pumps are particularly well suited for such services as mine and general sump drainage, dry-dock dewatering, irrigation, flood control, etc.

SYNTHETIC RUBBER—A booklet, "The Five Commercial Types of Synthetic Rubber," has been released by the United States Rubber Co., 1230 Sixth Ave., New York, N.Y. The booklet traces the development of synthetic rubber from its laboratory beginnings, describes the properties of the commercial synthetic rubbers, includes photographs of synthetic rubber manufacture, many diagrams, and gives the relative physical and chemical properties of natural rubber and of the five types of synthetic rubber.

WATER TREATMENT—Two new booklets, HDM-COF and HDM, describe the installation, operation and maintenance, and give the complete specifications of the Heavy Duty Midget Chlor-O-Feeder. Proportioneers, Inc., 9 Codding St., Providence, R.I.

WOOD PRESERVATIVE—The growing necessity for wood preservation—and what to do about it— is contained in an 8-page illustrated brochure published by I. F. Laucks, Inc., Seattle, Wash., entitled, "Laucks Wood Preservatives." Directed toward constructors of heavy laminated beams and arches, as well as manufacturers of sash, doors, plywood, and other wood products, "Laucks Wood Preservatives" explains the company's complete series of low-cost wood treatments for plant application.

GALVANIC
CORROSION

OF DISSIMILAR METALS

And how milliampere Gremlins may be foiled at their own game

Today, dissimilar metals must frequently be used in more or less untried combinations. This is made necessary by metal shortages and urgent production needs.

Such combinations when exposed to liquids or moisture can result in serious galvanic corrosion. Therefore galvanic couples now merit much closer attention by plant and design engineers than was previously necessary.

Also, since its effects are not readily distinguished from those of the ordinary types of corrosion, it frequently is blamed for troubles it could never cause. Yet when really present, galvanic corrosion may be very serious.

Practices for controlling Galvanic Corrosion

1 Select combinations of metals as close together as possible in the Galvanic Series.

2 Avoid combinations where the area of the less noble material is relatively small. It is good practice to use the more noble metals for fastenings or other parts in equipment built largely of less corrosion resistant material.

3 Insulate dissimilar metals wherever practical. If complete insulation cannot be achieved, anything such as paint or plastic coatings at joints to increase the resistances of the circuit will help.

4 Keep dissimilar metals as far apart as possible. This rule applies even when the actual connection between the metals is made external to the corrosive liquid.

5 Apply coatings with caution. For example, when painting—do not paint the less noble material without also coating the more noble, otherwise greatly accelerated attack may be concentrated at imperfections in coatings on the less noble metal. *Keep such coatings in good repair.*

6 Prevent or limit aeration of the corrosive liquid as much as possible to sustain the polarizing effect of the hydrogen film which forms on bare cathodic surfaces.

7 If practical, add chemical inhibitors to the corrosion solution according to the nature of the solution to be inhibited.

8 Avoid joining materials well apart in the series by threaded connections, as the threads will probably deteriorate excessively. Brazed joints are preferred when practicable.

9 Whenever possible, install relatively small replaceable sections of the less noble material at joints and increase the thickness of the less noble material in such regions; for example, by using extra heavy wall nipples in piping or by attaching replaceable pads to critical surfaces.

10 Install pieces of bare zinc or steel to provide a counteracting galvanic protection effect to suppress galvanic corrosion.

•

Inco's Technical Service is prepared to assist metal users in solving galvanic corrosion problems. Available data from Inco's Corrosion Files for a particular combination of metals will be furnished wherever possible. Aid can also be extended in applying general principles to specific problems.

As a first step in securing Inco's help on a specific corrosion problem, write for a copy of the Corrosion Data Work Sheet.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall Street, New York, N. Y.

GALVANIC CORROSION *and* THE GALVANIC SERIES

Galvanic Corrosion is caused by contact or connection of unlike metals in a corrosive liquid. Because generation of electric current is associated with galvanic corrosion, the metals act like a galvanic cell and corrosion action may become more serious and more rapid than that fostered by the corrosive liquid acting on the metals separately. Such action may be prevented or minimized by using the Galvanic Series to guide the selection of metal combinations.

GALVANIC SERIES

Corroded End (anodic, or least noble)

Magnesium
Magnesium alloys

Zinc

Aluminum 2S

Cadmium

Aluminum 17ST

Steel or Iron
Cast Iron

Chromium-iron (active)

Ni-Resist

18-8 Stainless (active)
18-8-3 Stainless (active)

Lead-tin solders
Lead
Tin

Nickel (active)
Inconel (active)

Brasses
Copper
Bronzes
Copper-nickel alloys
Monel

Silver solder

Nickel (passive)
Inconel (passive)

Chromium-iron (passive)
18-8 Stainless (passive)
18-8-3 Stainless (passive)

Silver

Graphite
Gold
Platinum

Protected End (cathodic, or most noble)

According to studies and practical experience from which the Series resulted, metals within a group have no strong tendency to produce galvanic corrosion of each other and therefore make relatively safe combinations unless the area of the less noble is markedly smaller.

The coupling of two metals from different groups and distant from each other in the list can result in galvanic, or accelerated corrosion of the less noble material. The farther apart the metals stand, the greater will be the galvanic tendency.

Although the arrangement of metals in the Series is based on results of experiments and practical experience involving many common corrosives, it cannot replace the need for tests when unusual corrosives are encountered or when other unusual conditions prevail that may cause major shifts of the relative positions of metals in the Series.

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Johnson, William LeRoy (M. '43), Secy. and Gen. Supt., Tanner Constr. Co., Box 1832, Phoenix (Res., 1047 East Lester St., Tucson), Ariz.

Jolley, Russell Lagrange (M. '43), Dist. Mgr., Ceco Steel Products Corp., Box 1311, Houston 1, Tex.

Joseph, Joseph Albert (Jun. '43), Engr., Applied Physics Laboratory, Johns Hopkins Univ., 8621 Georgia Ave. (Res., 8600 Manchester Rd.), Silver Spring, Md.

Kasman, John Clark (Jun. '43), Junior Field Engr., Dravo Corp., Neville Island, Pittsburgh (Res., 225 Broad St., Sewickley), Pa.

Kasten, Raymond Oliver (Jun. '43), 7301 Burrwood Drive, Apt. A, Normandy 21, Mo.

Keirsey, Robert Leslie, Jr. (Jun. '43), Stress Analyst, Douglas Aircraft Co., Santa Monica (Res., 1424 Veteran, West Los Angeles), Calif.

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Kupperman, Solomon Jack (M. '43), Structural Designer, Div. of Water Works Design, City of Chicago, 402 City Hall (Res., 5045 North Ridgeway Ave.), Chicago, Ill.

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Lambert, Lowell Edward (Jun. '43), Junior Public Health Engr., U.S. Public Health Service, 217 Carson Ave., Las Vegas, Nev.

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Lewis, John MacDonald (Jun. '43), Product Engr., Eastern Aircraft Div., Gen. Motors Corp., Tarrytown (Res., 31 Linden Ave., Ossining), N.Y.

McDonald, William Jamison (Jun. '43), Asst. Civ. Engr., Maps and Surveys Div., TVA, 501 Pound Bldg. (Res., 1001 Endicott St.), Chattanooga 5, Tenn

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Masur, Ernest Frank (Jun. '43), Structural Draftsman, Arthur G. McKee & Co., 3352 Michigan St., Indiana Harbor, Ind. (Res., 1410 East Hyde Park Blvd., Chicago, Ill.)

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Redding, John Howard (Assoc. M. '43), Capt., Corps of Engrs., U.S. Army, Engr. Headquarters, 1002 C.Z. Section, Army Post Office 704, Care, Postmaster, San Francisco, Calif.

Reynolds, Robert Jackson (Assoc. M. '43), Asst. Gen. Supt., Bechtel, McCone & Parsons Corp., North 50th St. (Res., 8011 Third Ave., South), Birmingham 6, Ala.

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Seese, Alfred Ray, Jr. (Jun. '43), 1097 Florida Ave., Akron, Ohio.

Senior, Harold Joseph (M. '43), (Freets, Tallamy & Senior), 5488 Main St. (Res., 91 Monroe Drive), Williamsville, N.Y.

Sheridan, Marlan Lee (Jun. '43), Test Engr., Brewster Aeronautical Corp., Johnsville (Res., 326 Summit Ave., Jenkintown), Pa.

Shields, Thomas George (Jun. '42), Lt. (jg) E-V (S), U.S.N.R., *U.S.S. Gwin*, Care, Fleet Post Office, San Francisco, Calif.

Stephenson, James Elmer (Jun. '43), Ensign, CEC, U.S.N.R., Mount Vernon, Ga.

Taylor, Alton Roderick (Assoc. M. '43), Private, U.S. Army, 4318–6 Court, Wylam Station, Birmingham 8, Ala.

Thalman, Walter Alfred (Jun. '43), Draftsman, Consolidated Vultee Aircraft Corp., San Diego, Calif.

Thatcher, William Miller (Assoc. M. '43), Structural Designer, Am. Bridge Co., 208 South La Salle St., Chicago, Ill.

Thenn, George Rudolph, Jr., (Jun. '43), 2d Lt., Corps of Engrs., U.S. Army, H. & S. Company, 30th Engrs., Fort Belvoir, Va.

Thompson, Burrell Braly (Jun. '43), 2d Lt., Corps of Engrs., U.S. Army, 449 Johnson St., Jacksonville, Tex.

Timms, Avery Junior (Jun. '43), Ensign, CEC-V (S), U.S.N., 1501 West 60th St., Los Angeles, Calif.

Torrence, Carl Linden (Jun. '43), Draftsman, Eng. Dept., R.F. & P.R.R., 404 Broad St. Station, Richmond 20, Va.

Tweedt, James Elmer (Jun. '43), Private, Air Force, U.S. Army, 6619 Pine Ave., Bell, Calif.

Underwood, Joel Curry (Assoc. M. '43), 1230 Peachtree St., N.E., Apt. 2, Atlanta, Ga.

Van Clief, William Carroll, Jr. (Jun. '42), Ramsey, N.J.

Vogelgesang, Edwin Charles (Jun. '42), Junior Stress Engr., The Emerson Elec. Mfg. Co., 8100 Florissant Ave., St. Louis, Mo.

Wagner, John Otjen (Jun. '43), Junior Hydr. Engr., TVA, 700 Union Bldg. (Res., 1717 Yale Ave.), Knoxville, Tenn.

Weaver, Gerald Gregory (Jun. '43), 215 Highland Ave., Williamsville, N.Y.

Weise, Jesse William (Jun. '43), Route 1, Box 36, Giddings, Tex.

Wells, Walter Goodwin (Jun. '43), Asst. Operator, Rail Detector Car, Sperry Products Inc., 1505 Willow Ave., Hoboken, N.J.

Wetherell, Edwin Henry (M. '43), (Wetherell & Harrison), Shops Bldg., Des Moines, Iowa.

Wheaton, Robert Garth (Jun. '43), With Methods Analysis Group, Douglas Aircraft Co. (Res., 1301 Ocean Ave.), Santa Monica, Calif.

White, Richard Charles (M. '43), City Engr., 501 City Hall (Res., 144 Indian Church Rd.), Buffalo, N.Y.

Williams, Hanen Harris (Assoc. M. '43), Lt. (jg), CEC-V (S), U.S.N.R., E2-53, Camp Peary, Va.

Woolpert, Ralph Lash (M. '43), (Ralph L. Woolpert Co.), 132 North Main St., Dayton, Ohio.

Zegarra, Edmund Joseph (Assoc. M. '43), Technical Engr., Douglas Aircraft Co., Inc., 5651 West Manchester Ave., Los Angeles, Calif.

Membership Transfers

Arning, Louis Henry (Jun. '38; Assoc. M. '43), Prin. Control Engr., Constr. Div., Eng. Dept., E. I. du Pont de Nemours & Co., 10th at Market St., Wilmington, Del.

Bowers, Douglas Albert (Jun. '38; Assoc. M. '43), Asst. Airways Engr., Civ. Aeronautics Administration, Box 665, Olney, Tex.

Dambach, William Nicholas (Assoc. M. '10; M. '43), Pres., W. N. Dambach, Inc., 500 Brushton Ave., Pittsburgh (Res., 1853 Graham Bldg., Wilkinsburg), Pa.

Degenkolb, Henry John (Jun. '36; Assoc. M. '43), Structural Engr., 2137 Turk St., San Francisco 15, Calif.

Flay, George Francis, Jr. (Jun. '36; Assoc. M. '43), Constr. Engr. and Estimator, Spencer, White & Prentis, Inc., 10 East 40th St., New York (Res., 2434 Thirty-fifth St., Long Island City 3), N.Y.

Levander, Carl Gustaf (Assoc. M. '31; M. '43), Asst. City Engr., Sewer Supt., City of Austin, Municipal Bldg. (Res., 4800 Ave. F), Austin 22, Tex.

Logan, James (Assoc. M. '14; M. '43), Engr., Santaniello Brothers, 34 Whyte St., Jersey City (Res., High and Evergreen Sts., Mount Holly), N.J.

MacNaughton, Ernest Boyd (Assoc. M. '08; M. '43), Pres., First National Bank, Portland 8, Ore.

Palmer, Benjamin Henry (Jun. '24; Assoc. M. '29; M. '43), Asst. Res. Engr., Ford, Bacon & Davis, Victory Yard, Groton (Res., 189 Harlan Rd., Norwich), Conn.

Park, Kenneth Foote (Assoc. M. '36; M. '43), Chf. Field Engr., R. G. Le Tourneau, Inc., Grant St., Peoria, Ill.

Paxson, Glenn Stuart (Assoc. M. '21; M. '43), Bridge Engr., State Highway Dept., State Office Bldg., Salem, Ore.

Reid, James Howard (Jun. '34; Assoc. M. '43), 1st Lt., Corps of Engrs., U.S. Army, Box 2240, Honolulu, Hawaii.

Santos, Tirso Nollora, Jr. (Jun. '28; Assoc. M. '33; M. '43), Structural Engr., War Dept., Box 347, B. Franklin Station, Washington, D.C.

Seghers, Guy Joseph (Assoc. M. '32; M. '43), Engr. and Surv., 306 Baronne Bldg., New Orleans, La.

Sturgeon, George Blair, Jr. (Assoc. M. '10; M. '43), Cons. Engr., Los Robles, Boyer Circle, Lafayette, Calif.

Sullivan, Edwin Quinby (Assoc. M. '18; M. '43), Dist. Engr., State Div. of Highways, Box 231 (Res., 601 Highland Ave.), San Bernardino, Calif.

Thomas, Robert Oliver (Jun. '39; Assoc. M. '43), Maj., Air Corp, U.S. Army, A. C. Depot, Army Post Office 953, Care, Postmaster, San Francisco (Res., 2220 India St., Los Angeles), Calif.

Reinstatements

Boyd, George Edward, Assoc. M., reinstated June 1, 1943.

Dyatt, Andrew Earl, Assoc. M., reinstated July 6, 1943.

Farrell, James Patrick, Assoc. M., reinstated June 23, 1943.

Heidenreich, Edwin Lee, Jr., M., reinstated June 28, 1943.

Nelson, Henning F., Assoc. M., reinstated June 23, 1943.

Pinel, Stanley Iven, M., reinstated June 23, 1943.

Turner, Webster Franklin, Assoc. M., reinstated June 17, 1943.

Zagoren, Louis Isaac, M., reinstated June 21, 1943.

Resignations

Buchta, Marion Arthur, Jun., resigned June 30, 1943.

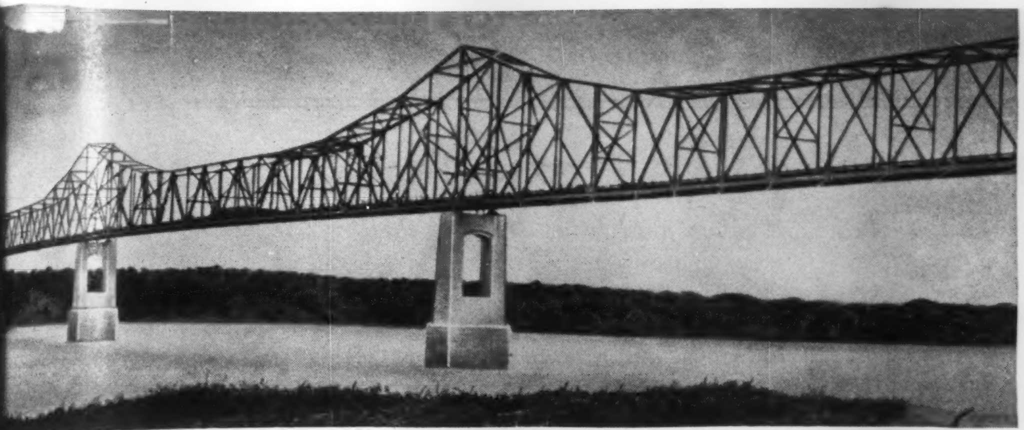
Grapes, Frank Edward, Jun., resigned June 30, 1943.

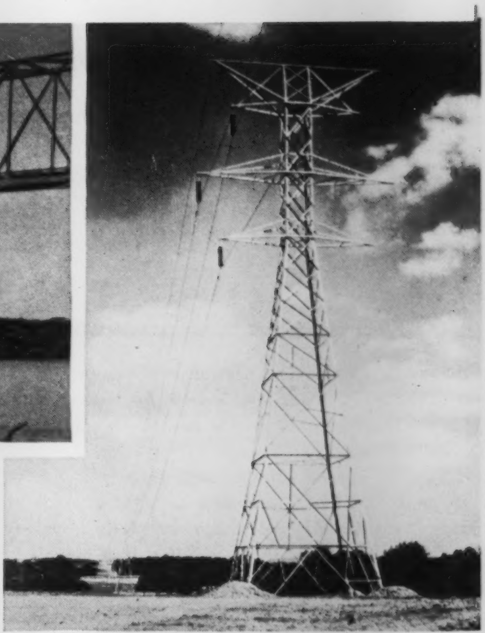
Griffin, E. Ray, M., resigned June 14, 1943.

Ketchum, Morris, Assoc. M., resigned June 30, 1943.

Krueger, Walter, Jr., Jun., resigned June 30, 1943.

Stem, Clifford Hoey, M., resigned June 22, 1943.





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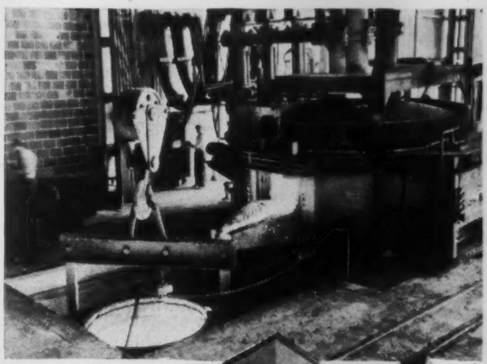

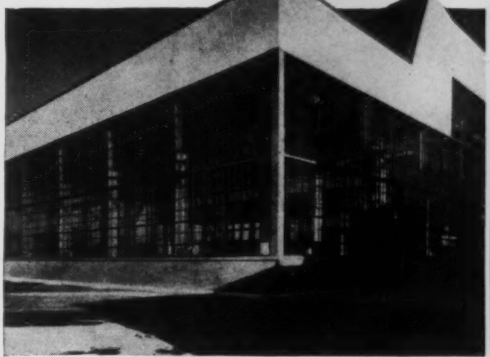

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United States Steel Export Company, New York

Applications for Admission or Transfer

Condensed Records to Facilitate Comment from Members to Board of Direction

AUGUST 1, 1943

NUMBER 8

The Constitution provides that the Board of Direction shall elect or reject all applicants for admission or for transfer. In order to determine justly the eligibility of each candidate, the Board must depend largely upon the membership for information.

Every member is urged, therefore, to scan carefully the list of candidates published each month in CIVIL ENGINEERING *and to furnish the Board with data which may aid in determining the eligibility of any applicant.*

It is especially urged that a definite recommendation as to the proper grading be given in each case, inasmuch as the grading must be based upon the opinions of those who know the applicant personally as well as upon the nature and extent of his professional experience. Any facts derogatory to the personal character or professional reputation of an applicant should be promptly communicated to the Board.

Communications relating to applicants are considered strictly confidential.

The Board of Direction will not consider the applications herein contained from residents of North America until the expiration of 30 days, and from non-residents of North America until the expiration of 90 days from the date of this list.

MINIMUM REQUIREMENTS FOR ADMISSION

GRADE	GENERAL REQUIREMENT	AGE	LENGTH OF ACTIVE PRACTICE	RESPONSIBLE CHARGE OF WORK
Member	Qualified to design as well as to direct important work	35 years	12 years	5 years RCM*
Associate Member	Qualified to direct work	27 years	8 years	1 year RCA*
Junior	Qualified for subprofessional work	20 years	4 years	
Affiliate	Qualified by scientific acquirements or practical experience to cooperate with engineers	35 years	12 years	5 years RCM*

* In the following list RCA (responsible charge—Associate Member standard) denotes years of responsible charge of work as principal or subordinate, and RCM (responsible charge—Member standard) denotes years of responsible charge of IMPORTANT work, i.e., work of considerable magnitude or considerable complexity.

APPLYING FOR MEMBER

ARMSTRONG, WILLIAM GILBERT, Baltimore, Md. (Age 37) (Claims RCA 9.9 RCM 3.6) Nov. 1929 to date with The Arundel Corporation, in various capacities, from Aug. 1938 to April 1942 Office Engr., Main Office, and since May 1942 Member of Operating Comm.

BRILEY, HAROLD DALE, Jacksonville, Fla. (Age 35) (Claims RCA 4.1 RCM 5.8) April 1943 to date Designing Engr., Russell & Axon, Cons. Engrs., Inc., St. Louis, Mo.; previously with U.S. Engr. Office as Asst. Engr. and Associate Engr.; Jun. Engr., U.S. Bureau of Reclamation.

COMPTON, CHARLES ROSS (Assoc. M.), Los Angeles, Calif. (Age 51) (Claims RCA 1.0 RCM 18.3) April 1925 to date with Los Angeles County San. Dists., as Office Engr., and (since Oct. 1940) Asst. Chf. Engr.

COOMAN, CARL CONRAD (Assoc. M.), Rochester, N.Y. (Age 51) (Claims RCA 9.8 RCM 15.9) 1923 to date Civ. Engr., Rochester (N.Y.) Gas & Elec. Corporation.

DAVEY, GEOFFREY INNES (Assoc. M.), Sydney, N.S.W., Australia. (Age 36) (Claims RCA 3.8 RCM 10.7) Aug. 1935 to Nov. 1942 in partnership, and Nov. 1942 to date sole Principal of firm, Gutteridge, Haskins & Davey.

FRENZEL, HARRY HORTON, Western Springs, Ill. (Age 54) (Claims RCA 8.5 RCM 13.7) Feb. 1943 to date with Senior Industrial Specialists, Bldg. Materials Branch, War Production Board, Washington, D.C.; previously Procurement Officer and Materials Supt., Minder Constr. Corporation; with Illinois WPA.

GREULICH, GERALD GREGORY (Assoc. M.), (Pittsburgh, Pa. (Age 47) (Claims RCA 3.7 RCM 20.0) Sept. 1933 to date Sales Engr., Carnegie-Illinois Steel Corporation, since May 1943 also Cons. Engr., Speciality Div., Sales Dept.

HEAP, GEORGE ALBERT, West Los Angeles, Calif. (Age 43) (Claims RCA 8.9 RCM 8.0) April 1943 to date Structural Engr., Lummus Co.; previously Chf. Structural Engr., Wyatt C. Hedrick, Archt.-Engr., Ft. Worth, Tex.; Civ. Engr. and Structural Designer, William J. Gage and Associates, Beverly Hills, Calif.

HESS, JAMES RUSSELL, Pittsburgh, Pa. (Age 54) (Claims RCA 5.0 RCM 14.2) July 1918 to Nov. 1919, March 1920 to May 1924 and Feb. 1926 to date with Structural Dept., Koppers Constr. Co., as Structural Draftsman and Squad Leader, Structural Designer, Asst. Head of Structural Dept., and (since Sept. 1929) Head of Structural Dept.

HUTCHISON, EDWARD ELMORE, San Francisco, Calif. (Age 51) (Claims RCA 4.5 RCM 11.3) May 1921 to Oct. 1934 and June 1938 to Jan. 1942 member of firm, Punnett, Parez & Hutchison, Civ. Engrs., and Jan.–Dec. 1942 of firm Parez & Hutchison, and Jan. 1943 to date in business under his own name, operating as Punnett, Parez & Hutchison, Civ. Engrs.

LAWRENCE, RAY ELLSWORTH (Assoc. M.), Washington, D.C. (Age 40) (Claims RCA 4.3 RCM 10.9) April 1942 to date successively Capt. Major, and Lt. Col., Corps of Engrs., U.S. Army; previously with Office of QM Gen. and Chf. of Engrs., Washington, D.C., as Chf. Water Supply Group, and with Civ. Eng. Unit, as Eng. Consultant, Eng. Branch, Constr. Div.; Prin. Asst. Engr., Black & Veatch, Cons. Engrs., Kansas City, Mo.

LIESKE, HAROLD WILLIAM, Louisville, Ky. (Age 37) (Claims RCA 2.7 RCM 5.9) Jan. 1941 to date with Corps of Engrs., U.S. Army, as 1st Lieut., Capt., and (at present) Major, acting as Area Engr.; previously with U.S. Engr. Office, St. Paul, Minn., in various capacities, finally as Asst. and Associate Engr.

LOEWUS, JULIAN SIMEON (Assoc. M.), Washington, D.C. (Age 41) (Claims RCA 6.1 RCM 6.1) Jan. 1937 to date with U.S. Coast Guard, at present as Chf., Damage Control Sec.; also Head of Chemical Warfare.

MCPHAUL, JOHN JOSEPH, Washington, D.C. (Age 46) (Claims RCA 7.3 RCM 13.5) July 1938 to date with Planning and Design Dept., Bureau of Yards & Docks, Navy Dept., as Associate Engr., Design Div., and Engr., War Plans Div.

RHODES, OSCAR SMITH, Atlanta, Ga. (Age 40) (Claims RCA 8.8 RCM 8.9) June 1942 to Jan. 1943 Asst. Airways Engr., and Jan. 1943 to date Associate Airways Engr., Dept. of Commerce, Civil Aeronautic Administration; previously with West Virginia Road Comm., finally as Res. Engr.

SHARKEY, FRED JOHN (Assoc. M.), Coulee Dam, Wash. (Age 58) (Claims RCA 13.1 RCM 11.7) July 1934 to date Office Engr., U.S. Bureau of Reclamation.

SILVERMAN, MAX (Assoc. M.), New York City. (Age 45) (Claims RCA 8.2 RCM 7.0) June 1935 to April 1937 and Aug. 1937 to date with New York City Dept. of Parks as Supt. of Constr., and (since Aug. 1937) Civ. Engr.; in the interim Bridge Designer, Robinson & Steinman, New York City.

SMITH, SAMPSON CARGILE, Tallulah, La. (Age 44) (Claims RCA 3.7 RCM 10.4) June 1942 to date with Louisiana Dept. of Public Works, as Dist. Engr.; previously Res. Engr., Louisiana Dept. of Highways.

SPENCER, ROBERT DONNELL, Cocoli, Canal Zone. (Age 37) (Claims RCA 0.9 RCM 7.6) May 1942 to date Supt., Frederick Snare Corporation; Senior Eng. Aide, Office Engrs., Panama Canal; Engr., Hamilton County Engr.'s Office, Cincinnati, Ohio.

SPURNEY, FELIX EMANUEL (Assoc. M.), New Orleans, La. (Age 40) (Claims RCA 6.6 RCM 12.7) June 1923 to March 1933, July 1934 to June 1937 and March 1942 to date with Turner Constr. Co., in various capacities, since Jan. 1943 as Executive Asst. to Vice-Pres.

STANLEY, EUGENE ANDERSON, Savannah, Ga. (Age 47) (Claims RCA 10.5 RCM 13.3) June 1939 to date Gen. Supt., Espy Paving & Constr. Co., Savannah; previously with Georgia Highway Dept. in various capacities.

STATHIS, NICHOLAS PETER (Assoc. M.), Washington, D.C. (Age 37) (Claims RCA 4.4 RCM 7.0) Jan. 1940 to date with U.S. War Dept., Office of Chf. of Engrs., Washington, D.C., as Associate Structural Engr., Squad Chf., and Specialist; previously Asst. Structural Engr., U.S. Dept. of Agriculture.

STOCKING, ERNEST JOSEPH (Assoc. M.), Arlington, Va. (Age 50) (Claims RCA 4.3 RCM 11.6) Sept. 1930 to date with Civil Service Comm., Washington, D.C., as Associate Examiner, Eng. Examiner, Prin. Examiner (Eng.), and (since Jan. 1941) Asst. Chf. of Examining and Personnel Utilization Div., Physical Sci. & Clerical Placement Sec.

STRICKLIN, CHARLES ERNEST, Salem, Ore. (Age 58) (Claims RC 14.6 D 20.1) June to Sept. 1911 and April 1912 to date with State Engr. of Oregon, in various capacities, since Oct. 1930 as State Engr.; also Secy., Hydro-Elec. Comm. of Oregon, and State Reclamation Comm., etc.

WALTER, HENRY WESLEY (Assoc. M.), Dundalk, Md. (Age 49) (Claims RCA 10.6 RCM 10.6) June 1927 to date with Bethlehem Steel Co. in various capacities, since Oct. 1941 as Engr. in charge of construction.

WHITE, LEONARD NEWTON, Little Rock, Ark. (Age 45) (Claims RCA 5.1 RCM 16.9) May 1942 to date Major, Corps of Engrs., U.S. Army; previously member of firm, Dickinson & White, Inc.

WILLIAMS, HENRY ERNEST, San Francisco, Calif. (Age 57) (Claims RCM 21.2) June 1937 to date Chf. Estimator and Office Engr., The Utah Constr. Co., San Francisco.

APPLYING FOR ASSOCIATE MEMBER

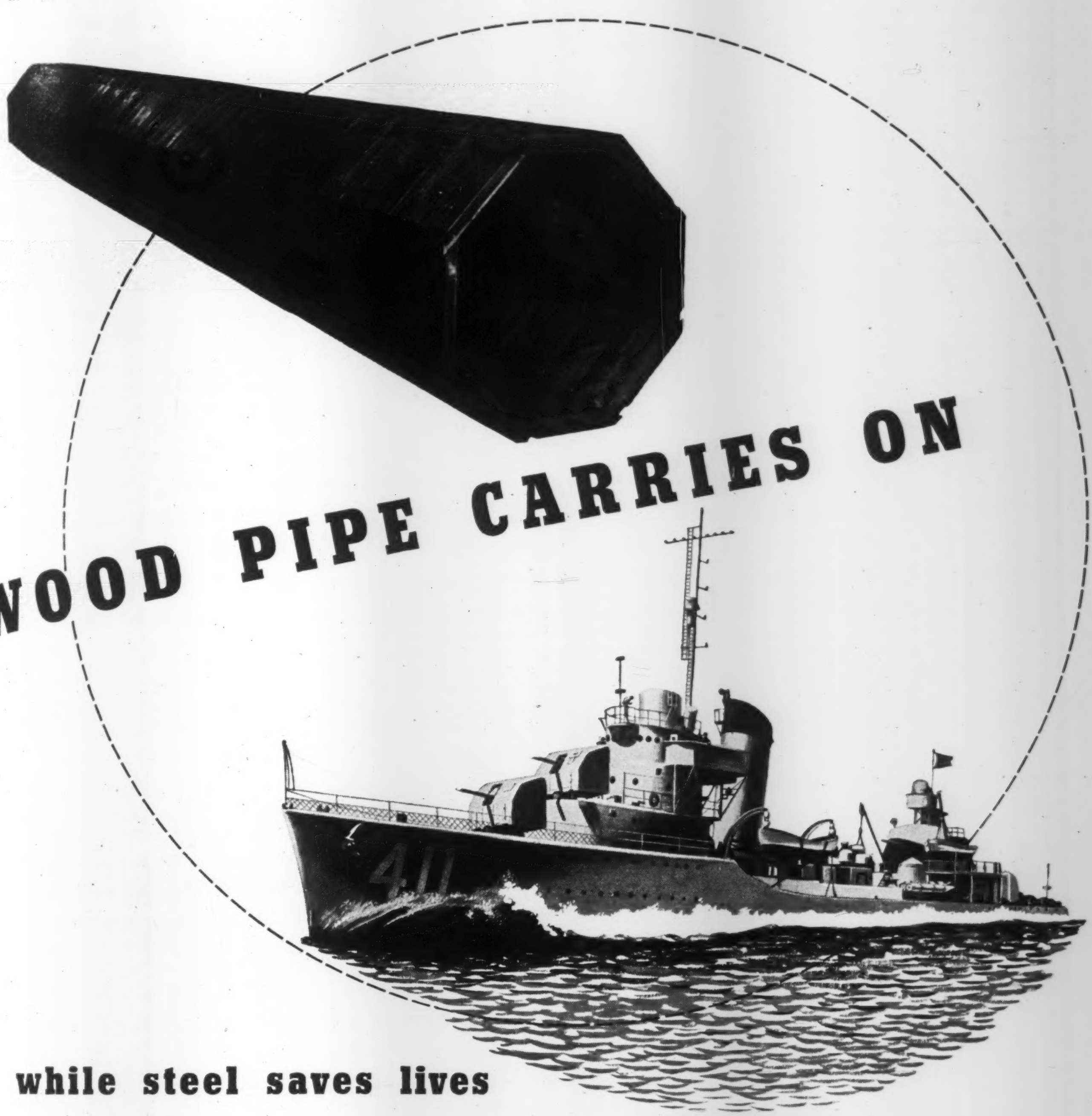
AMSTER, MAURICE NATHAN, Diablo Heights, C.Z. (Age 36) (Claims RCA 2.7) Aug. 1940 to date with Special Eng. Div., The Panama Canal, Diablo Heights, C.Z., as Jun. Engr., and (since May 1942) Asst. Engr.; previously with U.S. Waterways Experiment Station, Vicksburg, Miss., as Jun. Eng. Aide, and Eng. Aide.

BERGER, HILDING ERNEST, Duluth, Minn. (Age 40) (Claims RCA 6.1 RCM 1.0) June 1942 to date Progress Engr., Hercules Powder Co., Baraboo, Wis.; previously Civ. Engr. and Project Supt., Bureau of Agri. Eng. (SCS), Milwaukee, Wis.

BLACK, CHARLES HOWARD, Dayton, Ohio. (Age 30) (Claims RCA 4.5 RCM 2.9) June 1942 to date with Ralph L. Woolpert Co. as Prin. Engr.; previously with Putnam and Woolpert as Rodman, Transitman, Chf. of Field Party, and Designer.

BLISS, ELEAZAR HAYWARD, Wakefield, Mass. (Age 32) (Claims RCA 6.3 RCM 0.8) Sept. 1942 to date Superv. Engr., Defense Plant Corporation; previously Res. Engr., Gen. Elec. Co.; Asst. Chf. Inspector with Frank A. Barbour.

BLOODWORTH, WILLIAM ASPIN, Roseneath, Wellington, N.Z. (Age 30) (Claims RCA 4.4 RCM 2.0) Aug. 1935 to July 1936 and Aug. 1938 to date with Public Works Dept., Wellington, New Zealand, since Aug. 1936 Engr., Hydro-Electric Branch; in the interim Asst. to Mgr., Wellington Structural and Reinforcing Steel Co., Ltd.



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Burleigh, Albert Frederick (Junior), Rock Island, Ill. (Age 33) (Claims RCA 4.3) Aug. 1935 to date with U.S. Engr. Office, as Surveyman, Jun. Engr., Jun. Hydr. Engr., and (since Jan. 1942) Asst. Hydr. Engr.

Cys, Jack Herman, Boulder, Colo. (Age 36) (Claims RCA 7.0 RCM 5.6) Jan. 1943 to date Civ. Engr., War Dept., Camp Hale; previously Sub-Contr., under Pando Constrs. (Black & Veatch and Platt Rogers, Inc.); with Platt Rogers, Inc., Pueblo, Colo.

Edwards, Robert Josiah, Solon, Bedford P.O., Ohio. (Age 40) (Claims RCA 8.3 RCM 5.5) Sept. 1935 to Sept. 1941 Asst. Engr. and Civ. Engr., Survey Dept., and Dec. 1941 to date Civ. Engr., Cuyahoga County Engr.'s Office; in the interim on a special contract.

Elliott, Edwin Wiley, Waco, Tex. (Age 32) (Claims RCA 7.0) July 1942 to date Engr.-in-Chg., first with Palmer & Winters, Contrs., and since Dec. 1942 with Cage Bros.-Palmer & Winters; previously Senior Eng. Aide, U.S. Bureau of Reclamation.

Francis, Hines Kennon, Montgomery, Ala. (Age 39) (Claims RCA 4.7 RCM 7.0) March 1924 to date with Alabama Highway Dept. in various capacities, since Feb. 1939 Associate Civ. Engr. (Asst. Chf. Draftsman).

Fulton, Rex Herman, Sacramento, Calif. (Age 41) (Claims RCA 13.9) Aug. 1930 to date with California Div. of Highways, since Oct. 1933 as Associate Highway Engr., and Piorities Engr.

Funk, John Benjamin, Brunswick, Md. (Age 38) (Claims RCA 8.1 RCM 4.0) Sept. 1932 to date City Engr., Brunswick, Md.; also Cons. Engr. on general municipal work, etc., at Myersville and Thurmont, Md., and (6 months) Contr.'s Engr. with L. R. Waesche & Sons.

Garbarini, Edgar Joseph (Junior), Hermosa Beach, Calif. (Age 33) (Claims RCA 1.8 RCM 1.7) Dec. 1940 to date with Bechtel-McCone-Parsons Corporation, as Field Engr., and (since Nov. 1941) Asst. Supt.; previously Civ. Engr. Inspector, Pacific Gas & Elec. Co.; Civ. Engr., Dewell & Earl, Cons. Engrs.; Civ. Engr., California Comm., Golden Gate International Exposition.

Griffin, Alexander John, Detroit, Mich. (Age 50) (Claims RCA 18.0 RCM 10.0) 1925 to date Supt. with Dunbar & Sullivan Dredging Co.

Gross, Seymour (Junior), Winthrop, Mass. (Age 28) (Claims RCA 3.4 RCM 1.0) Sept. 1940 to date with Boston Navy Yard as Jun. Naval Archt. (Structural), Asst. Naval Archt. (Structural), and since Nov. 1942 Associate Naval Archt. (Structural); previously Estimator and Engr. with Dooley Bros., Inc., and Contr. in private practice; Senior Eng. Aide, Metropolitan Dist. Comm.

Hardison, Clayton Haines (Junior), Montgomery, Ala. (Age 32) (Claims RCA 4.7 RCM 1.2) July 1936 to June 1940 Jun. Hydr. Engr., and June 1940 to date Asst. Hydr. Engr., Water Resources Branch, U.S. Geological Survey.

Hopewell, Harry Tilden, Jr., Anchorage, Alaska. (Age 36) (Claims RCA 1.5 RCM 4.9) Aug. 1938 to date with Civ. Aeronautics Administration, as Jun. Civ. Engr., Asst. Civ. Engr., and (since June 1941) Associate Civ. Engr.

Koontz, Melvin Arthur, Sacramento, Calif. (Age 41) (Claims RCA 8.3) Oct. 1928 to date with California Div. of Highways, in various capacities, since April 1941 as Associate Bridge Engr.

Learned, Alvah Chester (Junior), Freeport, Tex. (Age 29) (Claims RCA 2.7 RCM 0.3) Jan. 1942 to date Engr., Asst. Supt., and (at present) Supt., Pipe Dept., Dow Magnesium Corporation, Velasco, Tex.; previously Engr., Dow Chemical Co., Freeport, Tex.; with Latex Constr. Co., Houston, Tex., finally as Asst. Supt. and Engr.

Ludin, Mohammad Kabir, Kabul, Afghanistan. (Age 32) (Claims RCA 2.9) June 1939 to date with Royal Afgan Ministry of Public Works in various capacities; previously Jun. Engr., U.S. Bureau of Reclamation.

Garry, John, Millville, N.J. (Age 31) (Claims RCA 5.9 RCM 2.0) Feb. 1941 to date with Corps of Engrs., Constr. Div., U.S. Army, in various capacites, since Aug. 1942 as Area Engr., Cape May County and Millville (N.J.) air bases; previously Inspection Engr., New Jersey Highway Dept.

Morgan, Harry S. (Junior), Macon, Ga. (Age 28) (Claims RCA 2.3 RCM 0.7) April 1942 to date with Holabird & Root, Inc., as Eng. Designer and Acting Dept. Head, Scioto Ordnance Plant, Marion, Ohio, and (since Feb. 1943) Chf. Civ. and San. Engr., Robins Field Air Base, Macon; previously Engr., Cedar Rapids (Iowa) Water Dept.

Morrison, Erwin Francis, Honolulu, Hawaii. (Age 37) (Claims RCA 8.0) 1940 to date with U.S. Engr. Dept., Honolulu, Hawaii, as Asst. Engr., Associate Engr., and (since 1942) Engr.; previously Engr., McCloud River R.R.; Constr. Engr., Goose Lake Box Co.

Noblette, William Boyd, Washington, D. C. (Age 36) (Claims RCA 4.2 RCM 1.5) At present 1st Lieut., Corps of Engrs., U.S. Army; previously Asst. Civ. Engr.; Asst. Engr. and Chf. Field Engr. with Wark & Co., Bldrs., Philadelphia, Pa.; Senior Inspector of Constr., Washington (D.C.) National Airport.

Rives, James Henry, Knoxville, Tenn. (Age 37) (Claims RCA 6.6 RCM 1.8) June 1943 to date Lt. (jg), U.S.N.R., CEC (Volunteer), Sea Bee Battalions, Camp Peary, Williamsburg, Va.; previously with TVA as Eng. Draftsman, Asst. and Associate Highway Engr., and Civ. Engr.

Robertson, Cecil Winston (Junior), Baytown, Tex. (Age 32) (Claims RCA 2.2 RCM 1.2) Feb. 1939 to Jan. 1940 and Sept. 1940 to date with E. B. Badger & Sons Co., as Job Engr., Constr. Engr., and Project Engr.; in the interim Chainman St. Louis & Southwestern R.R. Co.; previously with U.S. Engr. Dept., St. Louis, Mo.

Sahinen, George Fredolf, Helena, Mont. (Age 42) (Claims RCA 5.0 RCM 2.5) Aug. 1934 to date with State Water Conservation Board, as Draftsman, Chf. Draftsman, Acting Plans Engr., and Chf. Designing Engr.

Seeley, John Cooley (Junior), Norfolk, Va. (Age 31) (Claims RCA 5.3 RCM 0.3) Nov. 1936 to date with Shoecraft, Drury & McNamee, Ann Arbor, Mich., in various capacities, since Sept. 1942 on Navy contracts as Designing Engr. and Project Mgr.

Siegel, Leonard, Jersey City, N.J. (Age 30) (Claims RCA 4.3 RCM 1.6) Nov. 1940 to Oct. 1941 and Dec. 1941 to date with Mason & Hanger Co.; in the interim with Silas Mason Co., Shreveport, La.

Smith, Cecil Robert White, Honolulu, Hawaii. (Age 37) (Claims RCA 5.1) Oct. 1929 to date with U.S. Engr. Office, at Providence, R.I., and (since Jan. 1941) at Punahou, Honolulu, Hawaii, in various capacities, at present as Associate Engr. (Civ.) and Asst. Engr. (Civ.).

Sutton, Glenn Arthur, Kingman, Kans. (Age 35) (Claims RCA 7.4) March 1943 to date on leave from Kansas Highway Comm. as Field Engr., The Fluor Corporation, Ltd., Kansas City, Mo.; with Kansas Highway Comm., finally as Res. Engr.

Tipton, Richard Randolph, Ft. St. John, B.C., Canada. (Age 48) (Claims RCA 15.5 RCM 1.3) April 1934 to date with U.S. PRA, until March 1942 in San Francisco, Calif.

Toothaker, George Eugene, Kansas City, Kans. (Age 29) (Claims RCA 1.2) June 1942 to date with Lozier, Broderick & Gordon (Archt.-Engr.-Mgr. of Sunflower Ordnance Works), as Asst. Engr., and at present Senior Asst. Engr.; previously with Fraser-Brace Eng. Co. as Civ. Eng. Draftsman, and Civ. Eng. Designer; Draftsman, Stanolind Oil & Gas Co., Tulsa, Okla.; with Phillips Petroleum Co. as Apprentice Engr. and Draftsman.

Vinson, Gordon Robert, Savannah Beach, Ga. (Age 31) (Claims RCA 6.7) 1938 to date Res. Engr., J. B. McCrary Co., Inc., Atlanta, Ga.

von der Lippe, Paul, Tacoma, Wash. (Age 48) (Claims RCA 13.4 RCM 4.0) Jan. 1943 to date Engr. and Structural Designer, 2d Nisqually power project, Tacoma, Wash. (on war furlough from Bureau of Reclamation, Denver, Colo.); previously Associate Engr., Bureau of Reclamation, Denver.

Wallis, William Russell, Jr. (Junior), Marks, Miss. (Age 34) (Claims RCA 3.4) July 1928 to June 1943 with U.S. Engr. Office in various capacities, finally as Project Engr.; at present (on terminal leave) inducted into U.S. Army.

Westmoreland, Charles Riley, Oklahoma City, Okla. (Age 35) (Claims RCA 2.4) March 1942 to date with J. B. Converse & Co., Inc., and A. C. Polk, Archt. Engr., as Designer, and (at present) Asst. Engr. at Gadsden, Ala.; previously with Eng. Dept., Oklahoma City, Okla.

Wiley, John Safford (Junior), New Orleans, La. (Age 31) (Claims RCA 8.2) June 1940 to Dec. 1941 Asst. San. Engr. (Reserve), Dec. 1941 to Aug. 1942 Associate Public Health Engr., and Aug. 1942 to date Asst. San. Engr. (Regular Corps), U.S. Public Health Service, Dist. 4, New Orleans, La.; previously Engr., Bureau of Industrial Hygiene, Indiana Board of Health, Indianapolis.

Wilke, Harvey Robert (Junior), Ft. Belvoir, Va. (Age 27) (Claims RCA 3.3) April 1941 to date with Corps of Engrs., U.S. Army, as Instructor, Asst. Director and Director, Water Purification School; previously Supt. of sewage plant and sewerage system, Columbia, Mo.

APPLYING FOR AFFILIATE

Dungan, Richard Melburn, Kansas City, Mo. (Age 43) (Claims RCA 19.1) Feb. 1934 to date Vice-Pres. and Pres., B-D-R Eng. Corporation.

APPLYING FOR JUNIOR

Green, Robert Lowell, Berkeley, Calif. (Age 24) (Claims RCA 1.7) Feb. 1943 to date Ensign, CEC, U.S.N.R.; previously with Pacific Gas & Elec. Co.

Harris, John Norman, Orono, Me. (Age 25) June 1941 to date with State Highway Comm. until Jan. 1942 as Eng. Aide, and (since Jan. 1942) Acting Soils Engr.; since Jan. 1942 also part-time Instructor in Civ. Eng., Univ. of Maine.

Heitmann, William Arthur, Louisville, Ky. (Age 28) (Claims RCA 1.7) July 1939 to date with Flood Control Design Sec., U.S. Engr. Dept., as Eng. Draftsman, Jun. Engr., and Asst. Engr., and (since June 1942) Associate Engr.

McLean, William Robinson, Chattanooga, Tenn. (Age 31) (Claims RCA 2.4) Sept. 1937 to date with TVA, in various capacities, since June 1941 as Jun. Structural Engr.

Slade, Warren Mietzen, Santa Fe, N.Mex. (Age 28) (Claims RCA 1.1) April 1942 to date with U.S. Engr. Dept., as Senior Eng. Aide, and (since June 1942) Prin. Eng. Aide; previously with New Mexico State Highway Dept.

Thompson, Robert Allen, San Francisco, Calif. (Age 28)(Claims RCA 5.7) Jan. 1939 to date with Bethlehem Steel Co., since June 1942 as Reinforcing Steel Detailer and Estimator.

Weisman, Robert Leon, Baltimore, Md. (Age 29) (Claims RCA 3.5) Oct. 1942 to date Field Engr. and Surveyor, Perring & Remington; previously with War Dept. as Chf. of Survey Party, CQM. Corps, Edgewood Arsenal, Md., and Chf. of Survey Party and Asst. Res. Engr., U.S. Engrs., Trinidad, B.W.I.

1942 GRADUATES

UNIV. OF TEX.
(B.S. in C.E.)

	Age
Jenkins, Joseph Edwin	(28)

UNIV. OF WIS.
(B.S.)

Sodemann, Paul Charles	(25)

1943 GRADUATES

ALA. POL. INST.
(B.C.E.)

Cook, Malcolm Cade	(22)
Kershaw, Charles Gideon, II	(22)

UNIV. OF ALA.
(B.S. in C.E.)

Duncan, Frederick Francis	(21)
Shrubb, Bernard Wick	(22)
Swindle, Claude Cecil, Jr.	(22)

BROOKLYN POL. INST.
(B.C.E.)

Brenner, Nathan	(31)
Miscella, Theodore Paul	(27)

BUCKNELL UNIV.
(B.S. in C.E.)

Bergman, Charles Stephen	(22)

CALIF. INST. TECH.
(B.S. in C.E.)

Beckstead, Maurice Webster	(21)
Buchanan, John William	(20)
Dewdney, Harold Stuart	(22)
French, John Martin	(21)
Graner, Jesse Blaine	(21)
Grote, Albert Otto	(22)
Johnsen, Edwin George	(23)

UNIV. OF CONN.
(B.S.E.)

Condon, Joseph Moakley	(22)

CORNELL UNIV.
(B.C.E.)

Correll, William Bertie	(25)
Filby, Ellsworth Fisher	(20)

UNIV. OF DETROIT
(B.C.E.)

Cantrell, Terence Brewster	(22)
Di Mambro, Leo	(23)
Johnson, Donald Elmer	(23)
Ternes, Donald Joseph	(22)

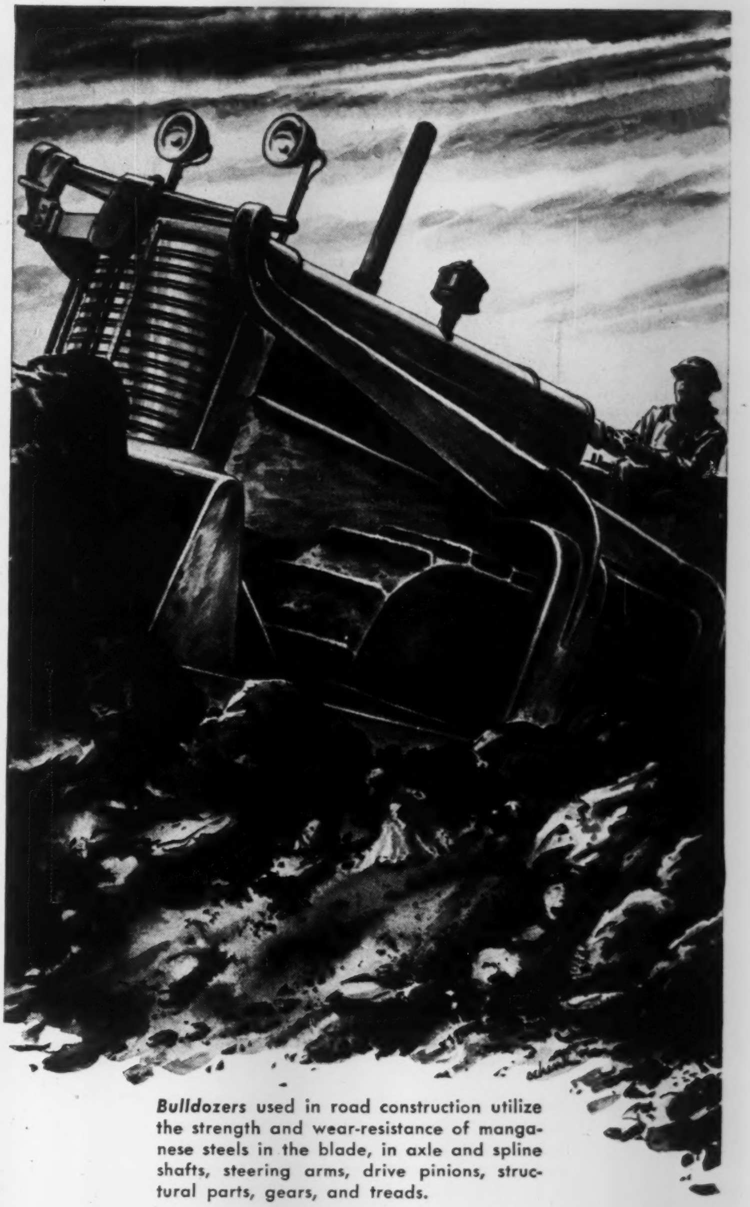
Why Manganese is used in ENGINEERING STEELS

Additions of 10 to 16 per cent manganese to steel greatly increase a steel's resistance to wear, and thereby broaden its applications in engineering jobs. These manganese steels . . . instead of quickly wearing away under conditions combining severe pressure, shock, and abrasion . . . will become harder through use, and will last longer.

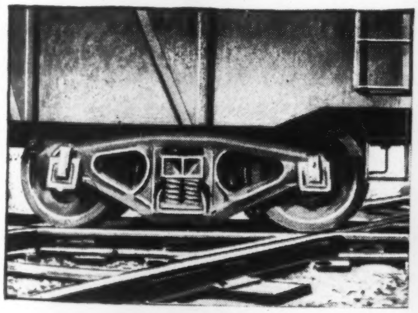
The ability of high manganese steels to workharden serves industry in important and varied applications. Manganese steel castings are used for railway frogs and crossings, rock-crusher parts, steam-shovel dipper teeth, dredge-bucket lips, centrifugal pump parts for gravel dredges. The chief application of rolled manganese steel is in rails used for special service, and for light forgings subjected to heavy wear.

Besides manganese, we produce other ferro-alloys and metals . . . such as chromium, silicon, vanadium, tungsten, columbium, boron, calcium, and zirconium . . . used in alloy-steel making. We do not make alloy steels, but we have over 35 years of experience with their development and use. If you have a problem in the selection or application of an alloy steel, call on us.

BUY UNITED STATES WAR BONDS AND STAMPS



Bulldozers used in road construction utilize the strength and wear-resistance of manganese steels in the blade, in axle and spline shafts, steering arms, drive pinions, structural parts, gears, and treads.



Railway crossings, frogs, and rails are made of high manganese steels to withstand the wear and the weight of heavily loaded trains that can not be delayed for road repairs.

Dipper bucket teeth are cast of Hadfield steel that increases in hardness and life-length under abrasive wear from gravel and rock in construction work.

Jaw crushers used in breaking up rock have wearing parts made of Hadfield steel because the steel gains longer life from cold working under heavy pressure and severe abrasion.

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Unit of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York, N. Y.
In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

Electromet
Trade Mark
Ferro-Alloys & Metals

UNIV. OF IDAHO
(B.S.C.E.)

Bennett, Grover Bryce	(22)
Bolton, Donald Frank	(22)
Crowe, Charles Fredric	(22)
Hyde, Gerald Raymond	(23)
Konen, Donald John	(22)
Rosti, Earl Kenneth	(21)
Russell, George Robie	(22)
Spofford, James Robert	(23)
Wilson, Harry Ray	(22)

ILL. INST. OF TECH.
(B.S. in C.E.)

Volakakis, John George	(22)

UNIV. OF ILL.
(B.S. in A.E.)

Anderson, La Verne Arthur	(25)
Collins, James Anthony	(21)
Dagit, Roland Harvey	(28)
Gertsch, Leonard Elvin	(24)
Gray, Henry Theodore	(25)
Kagawa, Wallace Kenso	(26)
Kellam, William Emory	(21)
Kessler, Phillip Arthur	(27)
Millett, Norman Charles	(23)
Morrisett, Robert Thomas	(23)
Shedd, Milton Campbell	(21)
Skoglund, Axel Fredrik	(23)

(B.S. in C.E.)

Ackerman, Raymond John	(25)
Bechly, Dan Smiley	(21)
Christianson, Hilmar Barman, Jr.	(21)
Hickman, William Albert	(22)
Lorentz, Robert Winfred	(24)
Murphy, William Grove	(22)
Pallister, Jack	(21)
Raulin, Albert Francis	(22)
Stromborg, Melvin Daniel	(27)
Wong, Homer Shing	(23)
Zumwalt, Dean Edwin	(22)

IOWA STATE COLL.
(B.S. in C.E.)

Andrews, James Donavon	(21)
Carstens, Robert Lowell	(21)
Cobb, James Forrest	(22)
Gross, George William, Jr.	(21)
Kline, Wendell Leon	(23)
Kusek, Louis Francis	(22)
Malony, George Allison	(20)
Pooley, Paul Eugene	(21)
Smith, Melvin Graves	(22)
Wilhelm, Harold Curtis	(22)
Wilson, Marion Evans	(21)

STATE UNIV. OF IOWA
(B.S. in C.E.)

Crumley, Clarence Cottrell	(22)

UNIV. OF KY.
(B.S. in C.E.)

Pendley, Laurence Chester	(24)

UNIV. OF MAINE
(B.S.)

Austin, John Maynard	(22)
Beverage, Arthur Walter, Jr.	(21)
Pease, George Marshall	(21)
Soderberg, Robert Howes	(22)

MANHATTAN COLL.
(B.C.E.)

Cotter, Thomas J.	(21)
Geismar, Leo William, Jr.	(22)
Gillen, James Stewart	(22)
Magrath, Frederick Neale	(20)
O'Sullivan, Richard Joseph	(22)
Wagner, Daniel Joseph	(22)

MASS. INST. TECH.
(B.S.)

Lee, Munny Ying Mun	(21)

UNIV. OF MICH.
(B.S.C.E.)

Flook, Lyman Russell, Jr.	(22)
Goodwin, Roger Eugene	(21)
Hoenke, Guy Arthur	(21)
Palmgren, Paul Arvid	(21)
Reagan, Arlie Denton, Jr.	(21)
Swenson, William Warren	(21)

UNIV. OF MINN.
(B.C.E.)

Anderson, Marshall Lloyd	(22)
Exner, Robert Emil	(22)
Johnson, Donald Leland	(24)
Kokoszenski, John	(23)
Opland, Richard Kenneth	(21)
Pehrson, Robert Charles	(21)
Reid, Walter Allen	(23)
Rood, Ellsworth Olaf	(22)
Westin, Harold Joseph	(23)

UNIV. OF MISS.
(B.S. in Civ.Eng.)

Anderson, William Crawford, Jr.	(26)
Brevard, Henry Clyde, Jr.	(21)

UNIV. OF MO.
(B.S. in C.E.)

Bishop, James Ketchel	(23)
Guinnee, John William	(23)
Hill, Richard Clayton	(21)
Hutton, Leo Yewell	(25)
McCabe, DeSoto Ben, Jr.	(23)
Storm, Lee Roy Rice, Jr.	(21)
Witherspoon, John Frank	(21)

MONT. STATE COLL.
(B.S.)

Albert, George Leland	(22)
Thuesen, Roger Johnson	(22)

UNIV. OF NEB.
(B.S. in C.E.)

Adler, Milton Robert	(21)
Bucher, James Dooley	(23)
Jones, LeMoyne Fred	(22)
Schlitt, Paul George	(22)
Yamashita, Thomas Isao	(22)

UNIV. OF NEV.
(B.S. in C.E.)

Ramsey, Duane Max	(21)

COLL. OF CITY OF N.Y.
(B.C.E.)

Alatsas, James George	(23)
Carcaterra, Thomas	(20)
Roggeveen, Vincent Jacob	(20)
Pistrang, Joseph	(20)
Wolff, Marvin Wilson	(21)

N.Y. UNIV.
(B.C.E.)

Kornspan, Martin Peter	(22)

N.C. STATE COLL.
(B.C.E.)

Dysart, Charles Eugene	(22)

N.DAK. AGRI. COLL.
(B.S. in C.E.)

Sites, Lester Anson	(22)

UNIV. OF NOTRE DAME
(B.S. in C.E.)

Perry, Thomas Walter	(27)

OHIO STATE UNIV.
(B.C.E.)

Miller, William Burk	(22)
Pauline, Henry Michael	(22)
Wright, Frank Henry	(31)

OKLA. A. & M. COLL.
(B.S. in C.E.)

Quirk, Willard Raymond	(23)

ORE. STATE AGRI. COLL.
(B.S. in C.E.)

Carlson, Carl Elmer	(24)
Carson, Walter Lee	(24)
Ewing, Robert Clark	(23)
Horstkotte, Gerry Arthur, Jr.	(25)
Wales, William Lovell, Jr.	(22)
Zoellner, Richard	(26)

S.DAK. SCHOOL OF MINES
(B.S.)

Beka, Charles Perry	(23)
Hedin, Delbert Nelson	(22)
Milne, Betty Marie (Miss)	(22)

S.DAK. STATE COLL.
(B.S.)

Bauer, Herbert Gottlieb	(21)

UNIV. OF SO. CALIF.
(B.E. in C.E.)

Blatt, Jules	(23)
Burke, Robert Oscar	(21)
Castro-Rodriguez, Otto	(23)
Choi, Smith	(23)
DeBerard, Robert Herman	(23)
Guillou, John Carroll	(22)
Lundin, Franklin Lester	(24)
Ogle, Claude	(22)
Roche, Richard Benedict, Jr.	(22)
Snyder, Robert Riley	(21)

STANFORD UNIV.
(A.M.)

Bradberry, Carroll Earl (1942 A.B.)	(22)

(A.B.)

Bustamante, Joaquin Redondo	(21)
Freeman, Verne Davis	(21)
Holmes, Oscar Charles, Jr.	(23)
LeMar, William Bernhardt	(20)
McFarland, Kirk Crawford, Jr.	(20)
Miles, Robert Jackson	(22)

UNIV. OF TENN.
(B.S. in C.E.)

Coulter, David Milton	(22)
Winn, Homer Powell	(25)

TEXAS A. & M. COLL.
(B.S. in C.E.)

Cox, Dwight Jernigan	(23)

TEX. TECH. COLL.
(B.S. in C.E.)

Clement, Walter Ernest	(22)

UNIV. OF TOLEDO
(B.E. in C.E.)

Ellis, Donald Thomas	(22)
Schaefer, Richard Carl	(25)

UNIV. OF UTAH
(B.S. in Civ.Eng.)

Cate, Sydney Luther, Jr.	(20)
Clayton, Nelson Widdison	(25)
Willes, Ralph Alvin	(23)

VA. MIL. INST.
(B.S. in C.E.)

Adams, Gordon Sackett	(21)
Anderson, James Aylor, Jr.	(21)
Bartenstein, Robert Mason	(22)
Bell, William Eugene	(21)
Bickerstaff, George Allen	(21)
Bounds, Carroll Jordan	(22)
Brantly, John Edward, Jr.	(21)
Carpenter, Whitman Stratton	(21)
Demmler, James Alvin	(21)
Emory, William Hemsley, Jr.	(22)
Frank, Warren Settle	(22)
Haskins, Guy Halifax, Jr.	(21)
Higgins, Ray Edgar	(21)
Hiner, John Tate	(22)
Hogan, Earl Fulton	(21)
Johann, William Henry, Jr.	(23)
Litton, John Winfield, Jr.	(22)
McGrath, John Kilby, Jr.	(22)
McLeod, Thomas Cole	(21)
Markin, William Dow	(22)
Mountcastle, Robert Boxley	(21)
Moyer, Chesley Maurice, Jr.	(20)
Nettrour, Byron Francis	(21)
Parrish, Jack McPherson, Jr.	(21)
Pettit, Overton Baker	(22)
Welton, Francis Conway	(23)

STATE COLL. OF WASH.
(B.S. in C.E.)

Imus, Warren Harding	(22)

UNIV. OF WASH.
(B.S. in C.E.)

Cysewski, Gerald Raymond	(25)
Drobnack, Edward James	(26)
Huey, Donald Robert	(21)
Pearson, Roland Arnold	(22)
Pyper, James	(23)
Running, William Arne	(22)
Starkey, Richard Sturtridge	(22)
Winegar, Marston Brown	(22)

W.VA. UNIV.
(B.S. in Civ.Eng.)

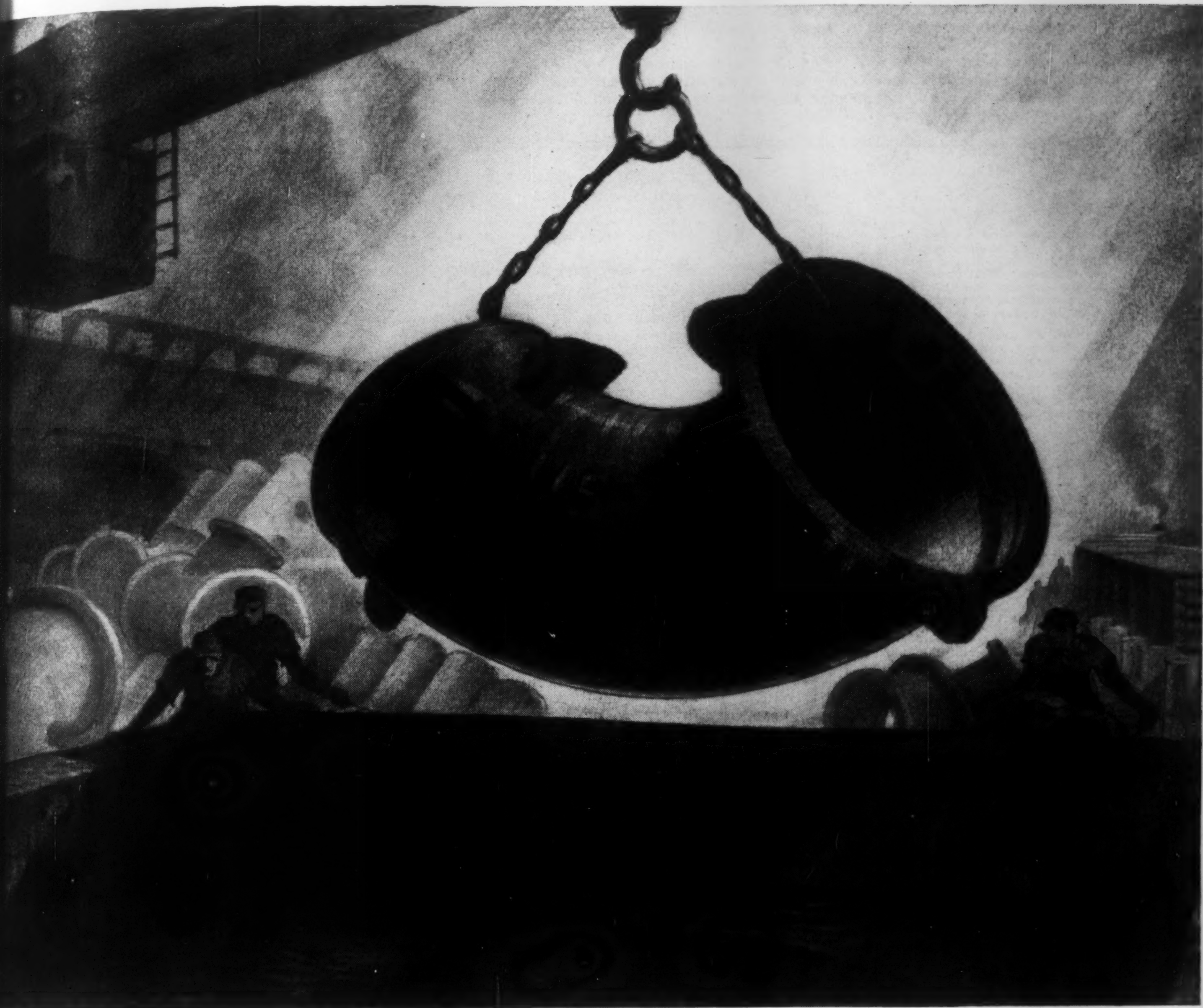
Siems, George Henry, Jr.	(22)

UNIV. OF WYO.
(B.S. in C.E.)

Gould, William Raymond	(25)
McDermott, Gerald Norman	(21)
Sullivan, Charles Clinton	(28)
Sutton, Roy Vernon	(28)
Swaisgood, Frank Raymond	(31)
True, Leland Beyer	(21)

The Board of Direction will consider the applications in this list not less than thirty days after the date of issue.

In re: Fittings



r-dipping a large cast iron fitting, drawn by Hugh Ferriss.

Today, the design and manufacture of standard and special cast iron fittings for water, gas and sewage lines is a specialized art in the modern pipe foundry. In fact, we operate a specialized plant, recently modernized and enlarged, for the manufacture of fittings. Progress in the art has been considerable as a result of years of product research, conducted independently in our laboratories as well as cooperatively with various engineering groups. If you have a problem in pipe design and fittings our technical staff is at your service.

UNITED STATES PIPE & FOUNDRY CO.

General Offices: Burlington, New Jersey. *Plants and Sales Offices throughout the U. S. A.*

Engineering Societies Personnel Service, Inc.

New York	Chicago	Detroit	San Francisco	Boston
8 W. 40 St.	211 W. Wacker Dr.	100 Farnsworth Ave.	57 Post St.	4 Park Street

The items listed below have been furnished by the Engineering Societies Personnel Service, Inc., which is under the joint management of the Four Founder Societies. This service is available to members and is operated on a cooperative, non-profit basis. In applying for positions advertised by the Service the applicant agrees, if actually placed in a position through the Service as a result of these advertisements, to pay a placement fee in accordance with the rates as listed by the Service. These rates have been established in order to maintain an efficient non-profit personnel service and are available upon request. This also applies to registrants whose notices are placed in these columns. All replies should be addressed to the key numbers indicated and mailed to the New York Office.

A weekly bulletin of engineering positions open is available to members of the cooperating societies at a subscription of $3 per quarter or $10 per annum, payable in advance.

Men Available

Engineer; Assoc. M. Am. Soc. C.E.; C.E.; registered professional engineer; 40; 17 years' experience (7 industry and 10 government) on all types of construction, including railroad, highway, dams, airports; 12 of these years in supervisory capacity over control of quality of construction. Well grounded in concrete, soil mechanics and stabilization, bituminous and other construction materials in general; member of leading technical societies. C-1.

Civil Engineer; Assoc. M. Am. Soc. C.E.; 35; licensed professional engineer, New York State; graduate C.E.; 14 years' general experience on heavy construction, such as tunnels, airports, and army base facilities, shipbuilding facilities, field surveying and office work related thereto. Available now. Location immaterial. C-2.

Civil Engineer; Assoc. M. Am. Soc. C.E.; Western Soc. of E.; 30; B.S.C.E. and M.C.E., Northwestern University, 1934 and 1943; Tau Beta Pi; 9 years' experience on all types of construction with three consulting firms and one contractor; last 3 years as general superintendent and base engineer for contractor on large air base in West Indies and other work; has traveled extensively. C-3.

Professor of Civil Engineering; Assoc. M. Am. Soc. C.E.; S.P.E.E.; licensed professional engineer; 43; M.S. in C.E.; 5 years' practical experience; 17 years' teaching and consulting practice (last 10 as head of civil engineering department); desires change of location for personal reasons. Technical author, lecturer, and traveler. Would consider position in smaller college planning expansion. C-4.

Civil Engineer; Assoc. M. Am. Soc. C.E.; 36; B.S.C.E. and M.C.E.; 10 years' experience in hydraulic and structural design and construction on water supply, hydroelectric, and industrial plant projects and appurtenant structures. Supervision of design and preparation of preliminary studies. C-5.

Civil Engineer; Assoc. M. Am. Soc. C.E.; B.S., U.S. Military Academy; graduate civil engineer and river and harbor courses, The Engineer School, U.S. Army; now available; 25 years' broad experience in teaching, training methods, planning, supervision, and executive duties pertaining to general construction, military engineering, and industrial safety. C-6.

Civil Engineer; Jun. Am. Soc. C.E.; graduate; young; single; draft exempt due to slight physical defect in right arm; some educational, construction, and industrial experience; desires position as instructor or research assistant in accredited university with opportunity to pursue graduate study leading to master's degree. Location North or West. Salary open. C-7.

Executive Engineer; M. Am. Soc. C.E.; age 45; completing $2\frac{1}{2}$ years as chief engineer of 50-million-dollar TNT, acid, and high-explosive plant. Previous 20 years on water supply and operation, structural, subways, railroads, municipal and in contracting business; 17 years as executive or in supervisory capacity. Registered, Illinois, Iowa, Ohio, and West Virginia. C-8.

Positions Available

Structural Draftsmen for detailing of prefabricated timber work and structural steel. Permanent. Salary, $3,000 a year for a 40-hour week. Location, New Jersey, W-2190.

Instructor for civil engineering department to teach geodetic surveying and highway engineering for Navy College Training Program, three 16-week terms. Temporary, possibly permanent. Location, Pennsylvania. W-2261.

Civil Engineer thoroughly experienced in water supply and sewerage disposal problems. will be in charge of design and operation of all water supply and sewerage disposal for the government in a given district. Salary, $4,600 a year. Location, East. W-2273.

Export Sales Representative, experienced engineer with selling experience abroad. Knowledge of Spanish and/or Portuguese an asset but not indispensable. Should have experience in sale of construction machinery. Headquarters, Middle West. Must be willing to travel extensively abroad. W-2357.

Superintendent of Water and Sanitation Distribution, control of supply, chlorination, estimates from rainfall data, daily charting of use, etc., of fresh water, distribution of salt water supply. Supervision of pumping equipment and operating personnel; supervision of sewerage system and incinerator. Civil Engineer with at least 5 years' experience in charge of water supply and sewerage in either small city or medium-sized community desirable. Salary, $4,000–$4,600 a year. Location, foreign. W-2370.

Sales Engineer, preferably over 38, with some experience in sales or design on highway or asphalt. Must be draft exempt. Salary, $3,600 a year plus expenses. Location, Pennsylvania. W-2386.

Civil, Electrical, Mechanical, and Aeronautical Engineers, preferably aeronautical engineering graduates, who have ability to work in aeronautical industry. Will receive a thorough training, probably beginning work as a draftsman. Civil engineers interested in structural design will work with such structures as fuselage, wing, and empennage, etc. The structures are dynamic rather than static. Company manufactures heavy aircraft. Salaries dependent upon education and experience, from $200 a month to $300 plus 42% for overtime. Location, state of Washington. W-2394.

Office Engineer, mechanical or civil, preferably with some shipyard experience to plan and expedite work and materials. Will act as assistant to general manager of a shipyard. Salary, $3,600–$4,800 a year. Location, East. W-2404.

Structural Designers or men with experience in detailing reinforcing steel. Salary, $3,300 a year maximum for a 40-hour week, plus overtime. Duration, about 4 to 6 months. Location, West. W-2412.

Promotional Engineer, 30–40, to contact contractors and construction engineers, etc. Must have a structural engineering background, preferably both design and field, and have a suitable personality. Salary, $3,600 a year plus all traveling expenses. Location, either Albany, N.Y., or Boston, Mass. Headquarters, New York, N.Y. W-2414.

Construction Superintendent for a large shipyard project. Must have had considerable experience on cofferdams, pile driving, marine ways, etc Must be able to organize and direct work. Should be over draft age and have some engineering background. Salary, about $7,000 a year. Location, South W-2422.

Structural or Architectural Draftsmen, preferably with industrial building background. Salary, $3,300–$3,900 a year for a 40-hour week, plus overtime. Location, Delaware. W-2443 (*a*).

Designers and Draftsmen, mechanical, electrical, and civil, for work in a shipyard. Salaries: Designers, $3,200–$5,720 a year; Draftsmen, $4,200–$4,680 a year. Location, South. W-2482.

Construction Superintendent who has had considerable experience on small-frame construction projects. Must be thoroughly qualified office man as well as a field supervisor, capable of directing design as well as making complete estimates. Salary open. Location, New York, N.Y. W-2493.

Engineers. (*a*) Graduate Civil or Mechanical Engineer for design, checking, and layout of industrial equipment such as continuous filters. Must be draft deferred. Salary, $1,820 a year for man with no experience; $2,600 a year for 2 or 3 years' experience. Permanent. (*b*) Engineer, either Civil, Mechanical, or Chemical, young, for sales and service department. Location, New Jersey. W-2496.

Structural Designers who have had some industrial building design. Work may develop into permanent job. Salary, about $4,000 a year. Location, Connecticut. W-2504.

Engineers. (*a*) Sales Engineer with experience in estimating, design, and sale of fabricated structural steel. (*b*) Estimator and Designer with structural steel fabrication experience. Salary open. Location, Pennsylvania. W-2512.

Concrete Estimator. Man who has had good experience in this line. Salary: $3,900–$4,160 a year. Location, New York Metropolitan area. W-2520.

RECENT BOOKS

New books of interest to Civil Engineers donated by the publishers and filed in the Engineering Societies Library, or in the Society's Reading Room, will be found listed here. The notes regarding the books are taken from the books themselves and are edited by members of the staff of the Society or of the Library. Those books which are in the Library may be borrowed by mail by Society members for a small handling charge.

Essentials of Drafting, 3 ed. By C. L. Svensen. D. Van Nostrand Co., New York, 1943. 295 pp., illus., diagrs., charts, tables, 10 × 7 in., cloth, $2.35.

The basic principles of drafting and their applications are covered in this text, without unnecessary ramifications. The result is a direct treatment suited to the needs of those who make drawings and those who are to read them. The new edition has been entirely rewritten and reset in a larger format.

Report on Significance of Tests of Concrete and Concrete Aggregates, 2 ed. Sponsored by A.S.T.M. Committee C-9 on Concrete and Concrete Aggregates. American Society for Testing Materials, Philadelphia, 1943. 171 pp., illus., diagrs., charts, tables, 9 × 6 in., paper, $1.50.

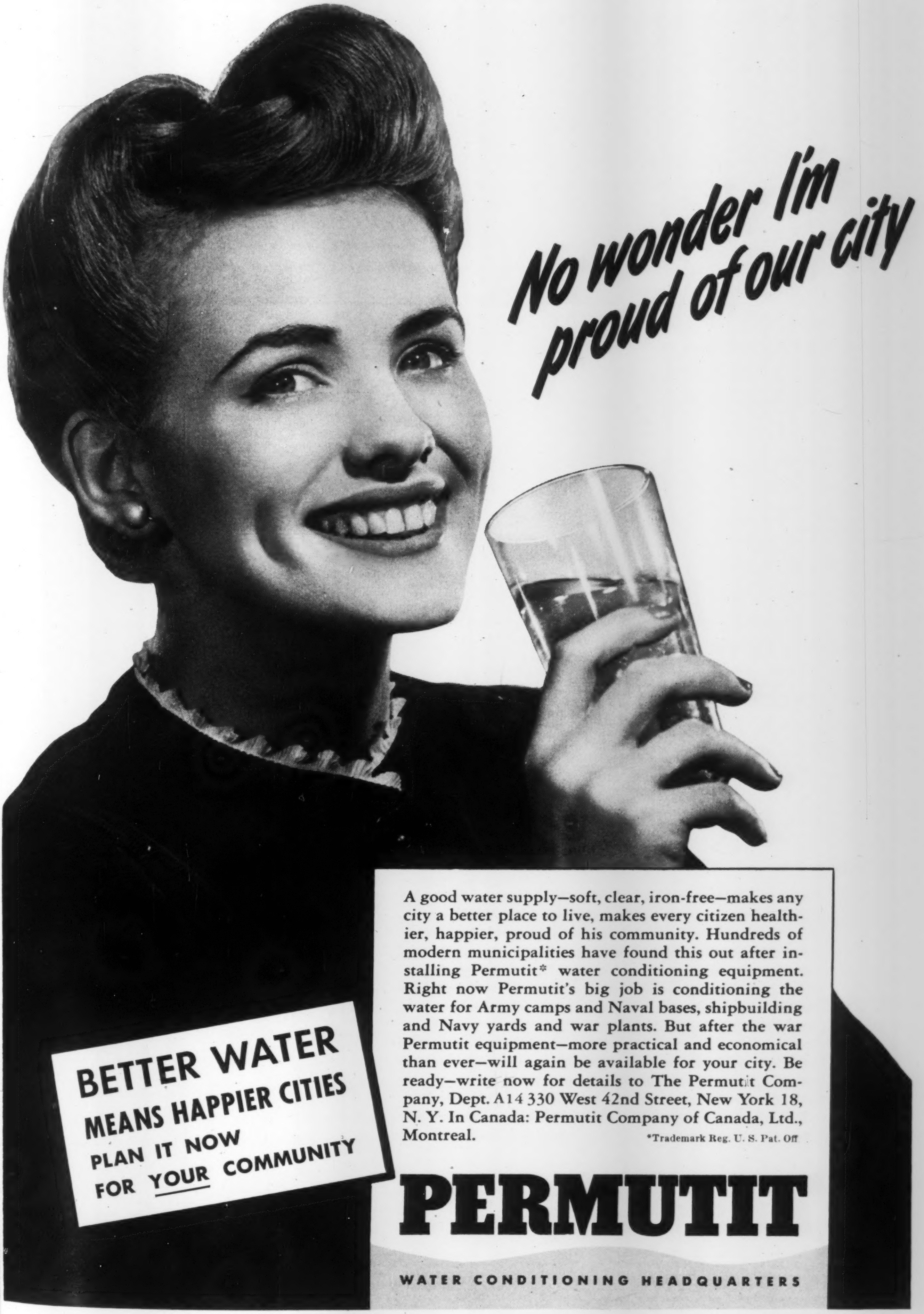
The significance of the tests sponsored by the Society, their limitations and applicability, are discussed by various experts. Tests for both concrete and aggregates are considered. In addition, the book includes a general discussion of the numbers of specimens or tests necessary for reasonable accuracy of the average.

Stream Flow, Measurements, Records and Their Uses. By N. C. Grover and A. W. Harrington. John Wiley & Sons, Inc., New York; Chapman & Hall, London, 1943. 363 pp., illus., diagrs., charts, tables, $9\frac{1}{2}$ × 6 in., cloth, $4.

The collection, computation, publication, and subsequent use of records of stream flow are discussed in this volume by authors with extensive experience in this field. The reasons why records of the quantity and quality of the discharge of surface streams and of ground water are needed as a basis for their development are explained. The selection of sites for gaging stations, and the equipment and operation of such stations, are described, together with the computing and publishing of the results.

Structural Members and Connections, 2 ed. Compiled by a staff of specialists; editors-in-chief, G. A. Hool and W. S. Kinne; revised by R. R. Zipprodt and F. N. Menefee. McGraw-Hill Book Co., New York and London, 1943. 639 pp., diagrs., charts, tables, $9\frac{1}{2}$ × 6 in., cloth, $6.

Intended as a reference work for engineers and students, this book treats comprehensively the general theory and, also, the detailed design of structural members and their connections. Numerous worked-out examples are provided. Steel, wooden, and reinforced concrete members are discussed. The new edition has been thoroughly revised.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BRIDGES

Cold Weather Construction. Highway Over Dam Rebuilt in Winter. *Eng. News-Rec.*, vol. 130, no. 18, May 6, 1943, pp. 682–684. In temperatures ranging to 35 deg below zero, old 10-ft highway bridge across Jackson Lake Dam in Wyoming was replaced by 20-ft concrete bridge, requiring alteration of gate piers and machinery; sections of job were completely housed inside structure made up of working platform, forms, and canvas shed.

Construction, Materials Conservation. Railroad Bridge Salvaged for Highway Use, C. A. Rothrock. *Eng. News-Rec.*, vol. 130, no. 18, May 6, 1943, p. 695. Details of utilization of part of steel superstructure of old railroad bridge in construction of 51-ft highway crossing by West Virginia State Road Commission, resulting in saving of 43 tons of reinforcing steel.

Demolition. Salvage Tacoma Bridge Metal, *Western Construction News*, vol. 18, no. 4, Apr. 1943, pp. 161–162. Need for critical materials in war program has caused Washington authorities to dismantle wrecked Tacoma Narrows Bridge now; project would normally be part of contract for construction of new bridge.

Design. Skew Parapet Girders, I. A. Cram. *Instn. Mun. & County Engrs.—J.*, vol. 69, no. 10, Mar. 30, 1943, pp. 346–354. Examination of some of types of skew parapet girders met in practice and indication of methods of calculating bending moments and shear forces involved; types of bridge constructions illustrated and discussed.

Floors. Bridge Deck Paved with Pumped Concrete on Plywood Forms. *Construction Methods*, vol. 25, no. 4, Apr. 1943, pp. 52–53 133–134, 136. Delivery of concrete to deck forms from pump on ground facilitated roadway paving on girder spans of 1,450-ft west approach for new highway bridge across Mississippi River at Dubuque, Iowa; set up at three separate locations, pump delivered concrete through 6-in. pipe up to 300 ft long, with as much as 50 ft of vertical rise, at rates of 18 to 20 cu yd per hour.

Highway. Design of Slab and Stringer Highway Bridges, N. M. Newmark, and C. P. Siess. *Pub. Roads*, vol. 23, no. 7, Jan.-Feb.-Mar. 1943, pp. 157–164. Report of investigation conducted by University of Illinois Engineering Experiment Station, Public Roads Administration, and Illinois Division of Highways; I-beam bridge, composite I-beam bridge, and concrete I-beam bridge, discussed; formulas for moments controlling design of slab and stringer bridges are applicable to wide range of sizes and proportions of bridges; procedures described are applicable generally to structures with span lengths from 20 to 80 ft, and beam spacings from 5 to 8 ft.

Highway, Reconstruction. Bringing Bridge Up to Date. *Eng. News-Rec.*, vol. 130, no. 22, June 3, 1943, pp. 798–800. Traffic requirements and need to rehabilitate deck of Pittsburgh bridge called for widening of existing roadway, installation of improved expansion dams, addition of combination curb and splash guards, also, construction of special non-clogging type of catch basins.

Highway, St. Johnsbury, Vt. New Bridge Over Old, A. D. Bishop. *Roads & Streets*, vol. 86, no. 5, May 1943, pp. 41–43. 890-ft Portland Street overpass in St. Johnsbury is notable for several design features, including open-type piers which straddle old low-level roadway, and use of four types of span design in deck girders; 126-ft suspension or river span girders are immediately above old truss span, which is to remain in service to accommodate local traffic.

Military. Common Suspension Bridge, A. C. Shortt. *Roy. Engrs. J.*, vol. 57, Mar. 1943, pp. 26–32, 1 supp. sheet. Problem was to provide bridge to carry pack animals in pairs over gap of 180 ft; structure was to be in use for 5 months and then dismantled and returned to store; improvisation of materials and equipment; construction details.

Natural Gas Pipe Lines, River Crossings. Constructing World's Longest Pipe-Line Suspension Bridge. *Gas Age*, vol. 91, no. 8, Apr. 22, 1943, pp. 44–45. Illustrations and brief text describing work on bridge on line of Oklahoma Natural Gas Co., crossing South Canadian River. Compare papers by G. R. Lunt and by D. B. Boydston, previously indexed from *Petroleum Engr.*, Mar. 1943, and from *Oil Weekly*, Apr. 5, 1943.

Railroad. Mass-Produced Underline Bridges. *Ry. Gaz.*, vol. 79, no. 15, Apr. 9, 1943, p. 381. To cut to minimum interference with traffic on electrified main line of New York, New Haven & Hartford Railroad, between New York and New Haven, 15 bridges recently have been renewed on mass production basis, by being lifted into position as completely assembled units, even to ballast and sleepers.

Railroad. Maintenance and Repair. Revamps Bridge Practices to Cope With Wartime Shortages, R. N. Brodie. *Ry. Eng. & Maintenance*, vol. 39, no. 2, Feb. 1943, pp. 100–102. Article explains how Boston & Maine Railway has changed its procedure in several major respects to meet conditions brought about by war.

Raising. Bootstrap Jacking Rigs Raise Bridge. *Eng. News-Rec.*, vol. 130, no. 16, Apr. 22, 1943, pp. 558–559. In leveling up James Street Bridge across Kaw River in Kansas City, Kans., to even grade for flood clearance, three span trusses were raised maximum of $6\frac{1}{2}$ ft by ingenious jacking arrangement; hydraulic jacks, supported on columns straddling end pin connections, lifted trusses through straps engaging truss pins; straps could be pinned to jack supports while resetting jack.

Steel, Demolition. Bridge Wreckers Use Special Blasting and Rigging Technique to Drop River Span on Land. *Construction Methods*, vol. 25, no. 3, Mar. 1943, pp. 70–71, 138–139. Details of wrecking 2,836-ft-long, 31-year-old Central Viaduct crossing Cuyahoga River in Cleveland, Ohio; center span of $231\frac{1}{2}$ ft carried at height of 103 ft above water level by tall masonry piers; feature of scheme of demolition was method employed for "throwing" river span so that as much of its length as possible would fall on land; 4,500 tons of scrap are being salvaged from the bridge.

Steel Truss, Dubuque, Iowa. Cantilever Methods Erect Three-Span Continuous Truss Bridge with Tied-Arch Middle Span. *Construction Methods*, vol. 25, no. 3, Mar. 1943, pp. 48–51, 114, 118, 121, 124, 126, 128, 130. Straight and balanced cantilever erection illustrated and described, as it was applied to steel construction for new highway bridge to carry route U.S. 20 across the Mississippi River; unique feature of bridge design is that 3-span structure is fixed in place at only one point and not at 2 bearings on same pier as is customary.

Steel Truss, Maintenance and Repair. Washed-Out Bridge is Hauled Back Upstream, Repaired and Replaced on Piers, H. W. Evans. *Construction Methods*, vol. 25, no. 4, Apr. 1943, pp. 60–61, 128, 130, 132. During flash flood of 1942, 73-ft bridge in Salem Township, Wayne County, Pennsylvania, was washed away and floated down stream 1,000 ft; description of sequence of operations in preparing washed out bridge for haulage along streambed back to original site.

Suspension, New London, Conn. Balanced Erection for New London Bridge. *Eng. News-Rec.*, (News Issue), vol. 130, no. 15, Apr. 15, 1943, pp. 522–523. Balanced and cantilever methods were used for erection of recently completed 5,926-ft Groton-New London (Conn.) bridge over Thames River; main river crossing is 1,245-ft deck cantilever with 352.5-ft anchor arms and 540-ft channel span, of which 216 ft is suspended deck truss.

Swing, California. Swing Bridge Is Semi-Welded, B. M. Shimkin. *Western Construction News*, vol. 18, no. 5, May 1943, pp. 206–208. Design studies for bridge over Mokelumne River in California indicated that swing type was more satisfactory than bascule and that welding some parts of truss would be more satisfactory than riveting; weight of metal, appearance, and cost all entered into estimates.

BUILDINGS

Air Conditioning, Office Buildings. Air Conditioning Equipment of Pentagon Building. *Sheet Metal Worker*, vol. 34, no. 2, Feb. 1943, pp. 32, 34, and 36. Details of air-conditioning system installed in U.S. War Department building; 20 miles of asbestos air duct installed; in excess of 12,000,000 cfm of air are moved by 560 fan units installed, while total of 88 dehumidifier units cool and control humidity of fresh air supply.

Camps, Military. Special Expedients Speed Construction of Naval Air Training Station. *Eng. News-Rec.*, vol. 130, no. 22, June 3, 1943, pp. 792–797. Much of training is being done on inland fields rushed to completion to serve first graduates of pre-flight schools; to save critical materials, timber, concrete, and second-hand steel had to be used; field-made laminated wood arches, columns, and truss chords were substituted for heavy thick timbers; 18 comfortable and efficient stations are now in use.

CITY AND REGIONAL PLANNING

Blighted Areas. Some Notes on Blighted Areas, P. V. I. Darling. *Planners' J.*, vol. 9, no. 1, Jan.-Mar. 1943, pp. 9–18. Observations on blighted areas and slums based on perusal of much of current writing on subject; causes of blight; economic losses; remedies.

Geology, Postwar. Geology in Postwar Planning, P. G. H. Boswell. *Nature* (London), vol. 151, no. 3835, May 1, 1943, pp. 493–495. Author presses claim of geology as one of primary considerations in national planning; it is pointed out that many war-planning mistakes might have been avoided if geological advice had been sought.

London. Town Planning Charter, H. W. Healy. *Engineer*, vol. 175, no. 4550, Mar. 26, 1943, p. 251, (editorial comment) 252–253. In scathing criticism of city of London, author urges provision of planning charter, recommendations for which are given.

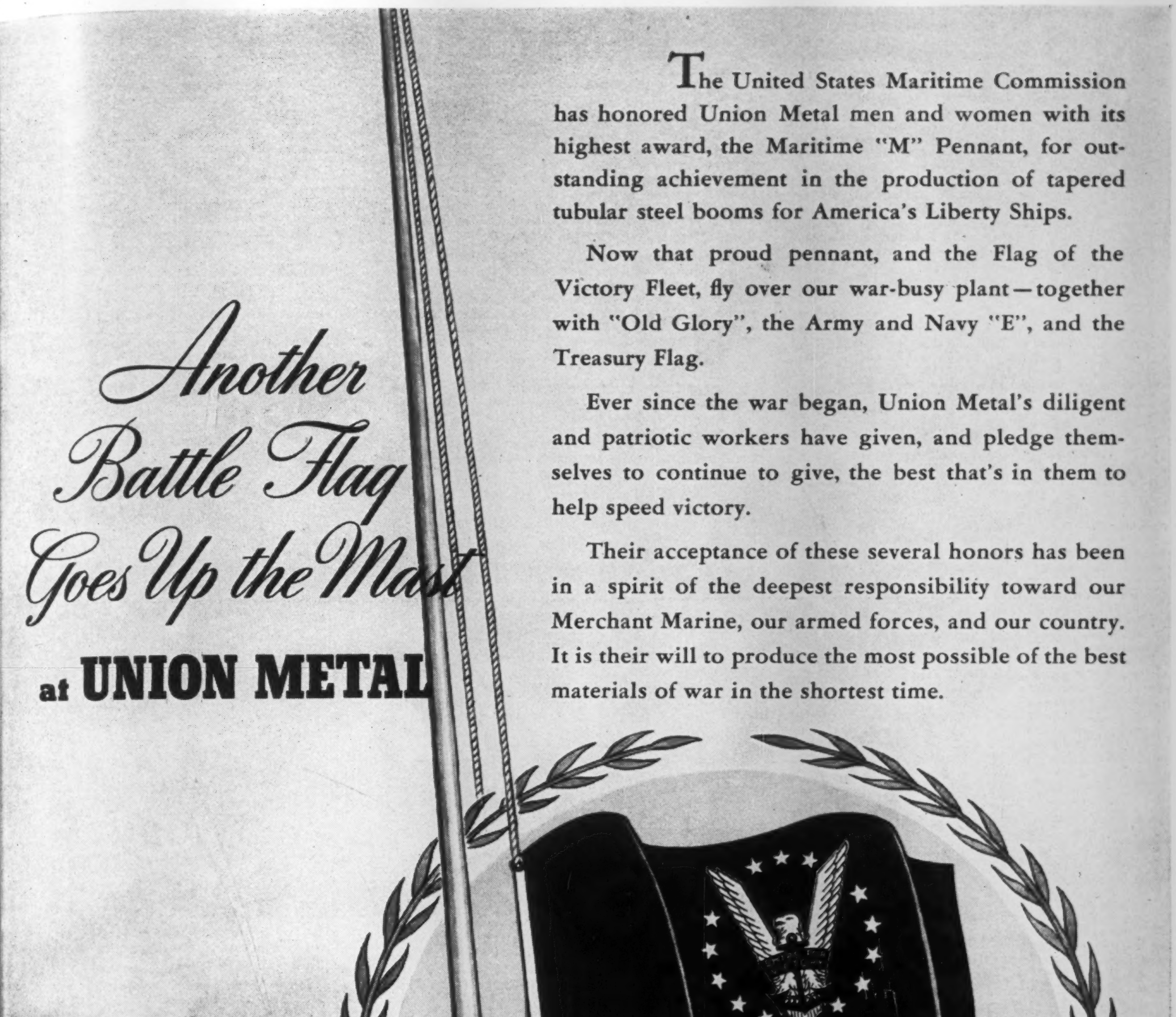
Mountain States Region. Industrial Development of Mountain States Region, W. Nelson and P. L. Harley. *Nat. Resources Planning Board—Report*, U.S. Gov. Printing Office, Washington, D.C., Dec. 1942, 62 pp., 20 cents. Study pertaining to war and postwar industries of Colorado, New Mexico, and Wyoming; suggestions for better balanced economic pattern for region and for specific localities.

Postwar. Postwar Planning as It Affects Architect and Citizen, T. F. Hamlin. *Architect & Engr.*, vol. 152, no. 3, Mar. 1943, pp. 26–31. Part that architects must take in designing postwar cities, homes, and buildings; author claims engineers are capable of planning "cities that work," but that humanistic phases must be work of architect who thinks of buildings in terms of people.

Postwar. Postwar Planning for Small City. *Western Construction News*, vol. 18, no. 5, May 1943, pp. 211–213. Long-range program of city of Inglewood, Calif., is presented as example of well worked out plan of postwar development.

Postwar. Town and City, W. G. Holford. *Roy Inst. Brit. Architects—J.*, vol. 50, no. 6, Apr. 1943, pp. 135–139. Author stresses importance of short-term planning, taking into consideration significant revises of past 10 years.

Present-Day Problems. Problem of Cities and Towns. Report of Conference on Urban-



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sm, Harvard Univ. Mar. 5–6, 1942, 116 pp. Foreward, A. H. Hansen; Economic Determinants of Urban Development: Urban Economy of Future, E. M. Hoover; Business Cycle and Urban Development, P. S. Samuelson; Effects of War Emergency, D. Hitchcock; What Kind of Cities Do We Want: Remarks on Plight of Cities and Approach to Remedy, E. Draper; Some Principles of City Planning, T. T. McCrosky; Kind of Cities We Want, C. Merriam; Approach to Planning, M. Meyer; Some Factors in City Rebuilding, J. L. Crane; Administrative and Legal Problems; More Power to Planning Agencies! E. J. Bohn; Role of Federal, State, and Local Governments: Proposal for Urban Redevelopment and Attempt to Describe Nature and Magnitude of National Problem, G. Greer; Role of State and Local Governments, A. Bettman; Post Conference Reflections, G. Green; New City Pattern for People and by People, W. Gropius and M. Wagner; general discussions given.

South America. Second Report on Latin American Planning, F. J. Violich. *Planners' J.*, vol. 9, no. 1, Jan.-Mar. 1943, pp. 19–30. Probems of Argentine, Brazil, Chile, and Uruguay are reviewed with sidelights on future trends.

CONCRETE

Airport Runways. Million-Yard Winter Paving Job. *Roads & Streets*, vol. 86, no. 5, May 1943, pp. 35–40. Established protective measures plus new methods were used in concreting large eastern airbase; field in question includes four runways and typical complement of taxiways; one runway is of 9-in. uniform thickness except for outer lanes and two center lanes, which are thickened to 12 in. in distance of 12½ ft; three runways have 8-in. slabs, with similarly thickened lanes; taxiways are 12-8-12; main and secondary roads in reservation area are 8-6-8 in. and uniform 6-in., respectively.

Airport Runways, Cold Weather Construction. Concrete Paving in Near-Zero Weather. *Eng. News-Rec.*, vol. 130, no. 16, Apr. 22, 1943, pp. 547–550. Laying 1½ million sq yd of concrete runways for large airport; usual cold weather methods were supplemented by heated mixer drums insulated truck tanks, calcium chloride in mix, and sand or straw covering to prevent subgrade from freezing; 12-in. straw blanket under heavy paper protected paved surfaces until concrete was safe from freezing; concrete was placed safely at 7 F while nights were as cold as 9 F below zero.

Barges. Barges of Concrete Found Economical. *Western Construction News*, vol. 18, no. 4, Apr. 1943, pp. 159–160. Construction has started in San Francisco on 350-ft, 10-hold ship-shaped concrete barges to help alleviate war-shipping shortage.

Bridges. Reinforced Concrete Bridges, P. L. Laing. *New Zealand Instn. Engrs.—Proc.*, vol. 28, no. 4, Jan. 15, 1943, pp. 244–272. Description of some of practices employed by Engineering Staff of New Zealand Public Works Dept. for a few years prior to 1938, and attempt made to illustrate by means of typical design.

Buildings. Bureau of Reclamation Practice in Design of Joints for Concrete Buildings, S. Judd. *Am. Concrete Inst.—J.*, vol. 14, no. 6, June 1943, pp. 557–563. Illustrated description of design and construction practice of Bureau in providing joints in reinforced concrete buildings; between large power units; at large changes in cross section; at junctions between parts of structures on foundations of different bearing value; at angles between portions of buildings; where buildings are weakened by openings; and where concrete placing is interrupted.

Cement. Modern Developments in Cements in Relation to Concrete Practice, F. M. Lea. *Instn. Civ. Engrs.—J.*, vol. 19, no. 4, Feb. 1943, pp. 224–253, (discussion) 253–274. Types of cement now available in Great Britain and abroad, and reasons why various kinds of cement of portland cement class show quite marked differences in properties; subjects selected to illustrate how modern developments in cements have influenced concrete construction are concrete work at low temperatures, mass concrete work, and shrinkage, cracking, and resistance of concrete to deterioration under adverse conditions of exposure.

Concrete Products Plants, Portable. Taking Concrete Block Plant to Job. E. Johnson. *Rock Products*, vol. 46, no. 5, May 1943, pp. 73–75. Interview with credited author; problem of building Naval Training Station involved requirement for 3,000,000 concrete blocks; factors leading to decision to erect demountable and movable concrete plants close to job site; description of two plants.

Construction. Job Problems and Practice. *Am. Concrete Inst.—J.*, vol. 14, no. 6, June 1943, pp. 593–598. Notes on following problems: Paint and Waterproofing Applied to Concrete Ships; Column Formula; Shear in Narrow Deep Beams; Vibration of Concrete in Test Cylinder Molds; Advantages of Stockpiling Aggregates, S. Walker and T. C. Powers.

Construction. Strength of Steel Anchors in Concrete, H. E. Graham. *Eng. News-Rec.*, vol. 130, no. 16, Apr. 22, 1943, pp. 560–561. Round and square 1¼-in. bars were embedded in concrete at distances varying from 10 to 40 in. and then pulled out with hydraulic jack; tables listing results of tests are given, and general conclusions reached are made available.

Construction. Three-Pin Portal Frame Construction in Reinforced Concrete. *Surveyor*, vol. 102, no. 2673, Apr. 16, 1943, p. 166. System of reinforced concrete framing, consists essentially of series of single-story portal frames forming ball of broad span without trusses or ties; frames are pin jointed at apex and at feet, and have rigid joint at eaves; as result, structure is statically determinate and may be designed in manner usual for three-pin arch.

Construction, Forms. TVA Saves Steel with Cantilever Forms, J. C. Patchen. *Eng. News-Rec.*, vol. 130, no. 16, Apr. 22, 1943, pp. 562–564. Use of cantilever forms for mass concrete on Douglas Dam (TVA), heretofore exponent of forms tied at top by diagonal rod, or strut and rod, will save 1,000 tons of steel on this project; description of new development presented.

Construction, Prestressing. Etude du Beton avec Usage des Precontraintes, C. E. Campeau. *Revue Irimestrielle Canadienne*, vol. 28, no. 112, Dec. 1943, pp. 444–460. Study of prestressed concrete; historical review; compression and tensile stresses; Freyssinet method; application to rectangular beam.

Culverts. Reinforced Concrete Culverts, A. W. Hill. *Roads & Streets*, vol. 21, nos. 241, 242, and 243, Jan. 1, 1943, pp. 20–22, Feb. 1, pp. 47–49, and Mar. 1, pp. 74–75. Notes given set out chief points in design of pipe, box portal frame, and suspended slab culverts; it is hoped that information will be of value to engineers.

Design. *In Situ* Concrete Decoration. *Concrete & Constr. Eng.*, vol. 38, no. 2, Feb. 1943, pp. 55–63. Notes and accompanying illustrations deal with decoration applied to concrete surfaces and methods employed to obtain these finishes.

Industrial Plants, Design. Concrete and Timber Aid Fast War Plant Construction. *Eng. News-Rec.*, vol. 130, no. 18, May 6, 1943, pp. 666–670. Details of heavy manufacturing plant being built of concrete and laminated timber; substructure is almost entirely non-reinforced, and steel demands are very low for total building; columns and crane girders are of reinforced concrete, and roof beams are of laminated timber construction; these roof beams are of 60-ft span, 7½ in. wide and 38 in. deep.

Masonry Materials, History. Brief History of Lime, Cement, Concrete and Reinforced Concrete, J. O. Draffin. *Western Soc. Engrs.—J.*, vol. 48, no. 1, Mar. 1943, pp. 14–47. Development of limes and cements; physical and chemical properties of cement; development of proportioning and placement of concrete; reinforced concrete; present-day diversified applications.

Permeability. Permeability of Concrete, R. Allen. *Civ. Eng.* (London), vol. 38, no. 440, Feb. 1943, pp. 32–33. Explanations and nature of permeability; methods of determining permeability; results show that too little mixing water in lean mixes is conducive to permeability; influence of cement content, curing, grading, admixtures, aggregates, and workmanship are discussed. Bibliography.

Properties. Function of Entrained Air in Concrete, H. L. Kennedy. *Am. Concrete Inst.—J.*, vol. 14, no. 6, June 1943, pp. 529–542. Use of air-entraining agents in portland cement concrete shows considerable promise, particularly in highway concrete where resistance to scaling is important factor; need for fundamental research regarding mechanism, by which entrained air functions is suggested and methods of tests are outlined.

Reinforcement. Prestressed Concrete, Design Principles and Reinforcing Units, H. Schorer. *Am. Concrete Inst.—J.*, vol. 14, no. 6, June 1943, pp. 493–528. Steel stress limitation in ordinary reinforced concrete design discussed; it is shown how working stresses may be increased by use of monolithic, prestressed concrete construction; description of self-contained prestressed reinforcing units given, and advantageous combination of high yield point steel wire and high early strength concrete pointed out; conclusions compared with observations on prestressed prisms and test beams.

Reservoirs. Prestressed Concrete Reservoirs. *Concrete & Constr. Eng.*, vol. 38, no. 3, Mar. 1943, pp. 104–105. Reservoir illustrated and described is one of two that have been completed by Work Projects Administration in Iowa; tanks have inside diameter of 106 ft, height to overflow of 30 ft, capacity of 2,000,000 gal each, and dome with rise of 13 ft 6 in.

Road Materials. Lean-Mix Concrete Used for Roads, D. V. Darwin. *Eng. News-Rec.*, vol. 130, no. 18, May 6, 1943, p. 685. Extracts from report of Country Roads Board, Victoria, Australia, on experience in forming highway pavements by rolling layers of lean concrete as means for determining what economies could be made in use of cement.

Roads and Streets. Concrete Road and Runway Construction in America, A. H. D. Markwick and H. S. Keep. *Roads & Road Construction*, vol. 21, no. 244, Apr. 1943, pp. 100–105. Report describes construction practice and machinery with particular reference to differences that exist between British and American practice.

Roads and Streets. Design of Concrete Pavements with Minimum of Steel. *Roads & Bridges*, vol. 81, no. 5, May 1943, pp. 34–37, 62, 64. Use of steel in various ways in concrete pavements has been affected by wartime conditions, so, under direction of committee of Highway Research Board, recommendations have been formulated to provide for minimum use of steel under current conditions; text of these recommendations given.

Roads and Streets. Wartime Design in Concrete for Airport Runway and Highway Pavement Slabs, D. O. Robinson. *Eng. & Contract. Rec.*, vol. 56, no. 16, Apr. 21, 1943, pp. 16–17. Operation of Canada's war economy has imposed certain modifications of standards of design and construction of concrete pavements common in times of peace; modifications have been rendered necessary by three principal shortages—that is, shortage of construction labor, of reinforcing steel, and of burlap for curing purposes; article discusses briefly, present standards of construction and design in light of shortages isted.

Roofs, Fireproof. Thin Concrete Roof Withstands Fire Test, J. E. Kalinka. *Eng. News-Rec.*, vol. 130, no. 22, June 3, 1943, pp. 804–805. Ability of thin shell concrete barrel roofs to withstand fire was demonstrated at military establishment when partly cured concrete shells were subjected to extreme heat and sudden load changes as supporting formwork burned away; examination showed damage confined to light spalling and minor cracking; load tests proved structural soundness of concrete.

Sewage Tanks. Repairs Save Concrete Tank After Settlement Causes Cracks. *Eng. News-Rec.*, vol. 130, no. 20, May 20, 1943, pp. 754–755. Three-compartment Imhoff sewage disposal tank at alien reception center on West Coast, developed cracks of destructive nature on first filling; Army engineers devised ingenious means of quickly reinforcing concrete walls in which cracks had developed; method described.

Ships. Concrete Ships. *Shipbldg. & Shipg. Rec.*, vol. 61, nos. 15 and 16, Apr. 15 and 22, 1943, pp. 348–351. 14,000-ton sea-going barges of 56-ft beam, 38-ft depth, and 376-ft length, built in three pours according to Maritime Commission specifications. Previously indexed from *Eng. News-Rec.*, Dec. 31, 1942.

Water Tanks and Towers. Elevated Tanks of Concrete. *Western Construction News*, vol. 18, no. 3, Mar. 1943, pp. 110–112. Water-storage tanks of prestressed concrete occupy upper 37 ft of 145-ft towers built by continuous pour, sliding form method at Kaiser Company's iron and steel mill at Fontana, Calif.

Water Tanks and Towers. Reinforced Concrete Water Towers, G. H. Humphreys. *Concrete & Constr. Eng.*, vol. 38, no. 3, Mar. 1943, pp. 85–102. Structure described and illustrated is circular 2-compartment reinforced concrete tower having capacity of 140,000 gal and depth of water of 15 ft. Design of tank embodied following features: simplicity in appearance, protection against frost to all pipes by means of external circular wall, ease of access to tank, pipes, and fittings, and accommodation for storing materials.

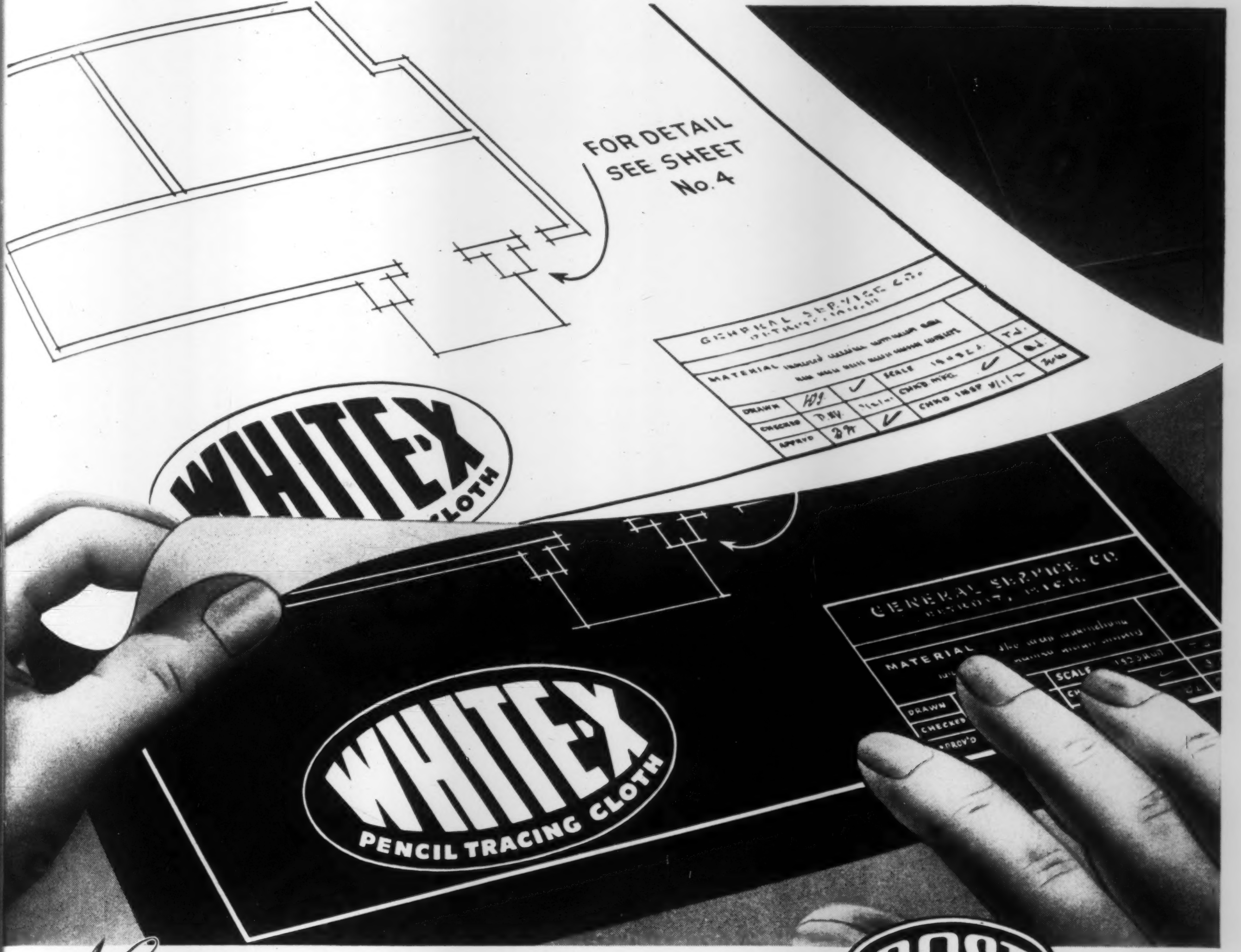
Water Tanks and Towers. Square Bands on Pre-Stressed Tank, R. C. Kennedy. *Western Construction News*, vol. 18, no. 4, Apr. 1943, pp. 169–170. Square stressing bands found to be much easier to handle and place, and development of welded box-type steel beam to replace turnbuckle results in cheaper, simpler placing and uniformity of tension on all of rods circling tank.

CONSTRUCTION INDUSTRY

Cold Weather Probelms. Winter Protection for Construction. *Eng. News-Rec.*, vol. 130, no. 20, May 20, 1943, pp. 738–741. In constructing Army hospital in northern location five different contractors used two methods of protection on winter foundation construction and four distinct methods in building walls; al buildings have continuous plain concrete footings surmounted by concrete block foundation walls and 4-in. brick walls; each method described and advantages and disadvantages discussed.

Post-War. Civil Engineers and Buildin Industry, A. Binns. *Engineer*, vol. 175, no 4544, Feb. 12, 1943, pp. 133–134. Résumé o fifth and last meeting of conference convened b Institution of Civil Engineers. See also report o meeting on pp. 130–131 of the same issue.

Postwar. Postwar Construction Plans, V B. Stanbery and M. Scott. *Western Constructio News*, vol. 18, no. 4, Apr. 1943, pp. 156–15 Tremendous population increases in West, com bined with ew industries, power resources an transportation facilities, indicate great construc tion needs at war's close, including homes, wate supply, sanitation, commercial structures.



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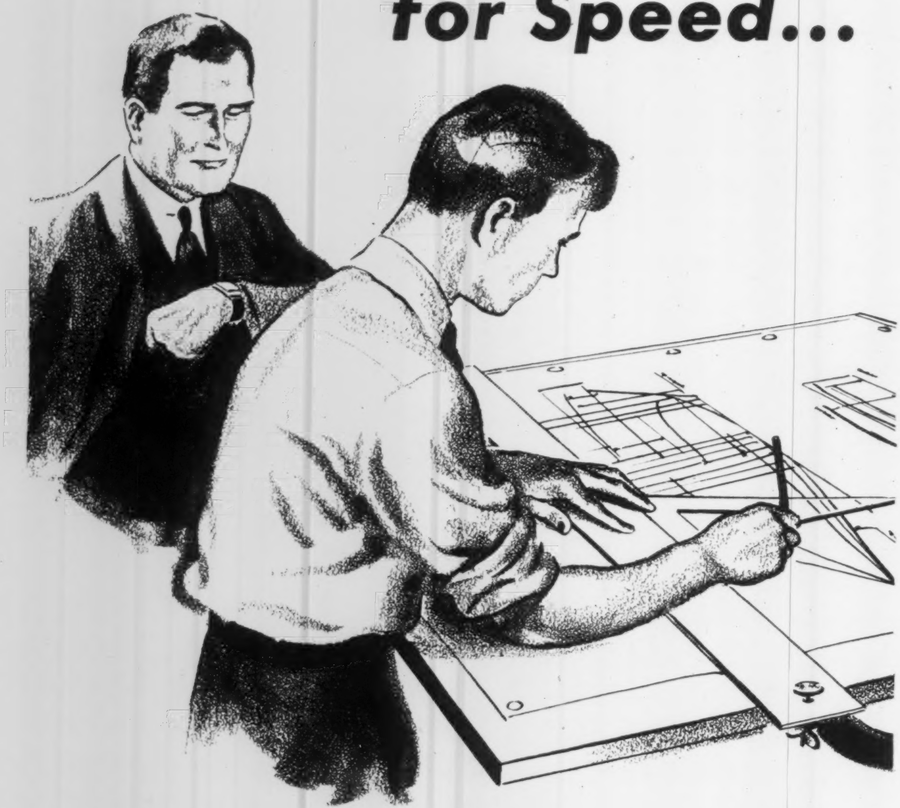

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DAMS

Cableways. Cableway Speeds Rock Placing in Niagara Falls Weir. *Construction Methods*, vol. 25, no. 4, Apr. 1943, pp. 58–59, 138. To build submerged weir in Niagara River, cableway one-half mile long was erected between tall tower on artificial island and head tower on Ontario shore; cableway handled up to 500 tons of rock per 10-hour day; layout and operation of cableway, towers, and propulsion equipment given.

Concrete Gravity, Pennsylvania. Guy Derricks Place Concrete for Loyalhanna Dam. *Construction Methods*, vol. 25, no. 3, Mar. 1943, pp. 60–61; 137–138. General construction scheme and details of method and equipment used in constructing gravity-type dam, 760 ft long and 130 ft high, which is one of 5 flood control structures to protect Pittsburgh area; foundation excavation and concreting handled within earth-filled double-wall cofferdams; concrete mixed at central plant; derricks with 135-ft masts and 120-ft booms, spaced along axis of dam, handle placement of concrete in bottom dump buckets.

Concrete, Plugs. Design and Construction Methods for Tight Plug in Concrete Dam. *Eng. News-Rec.*, vol. 130, no. 18, May 6, 1943, p. 684. Typical problem in making satisfactory plug in concrete dam, to effect watertight closure of roadway opening, was given careful attention in design of San Vincente Dam at San Diego; details of design and methods employed are given.

Design. Diques Livianos y aligerados, A. Forti. *Ingenieria* (Buenos Aires), vol. 46, no. 818, Dec. 1942, pp. 939–950. Light-weight and relieved dams; general characteristic of "liviano" dam is that upstream face has slope of 45 deg more or less, so that hydrostatic pressure contributes to stability and permits reduction in dimensions of buttresses; "aligerado" type retains characteristics of massive gravity dams and is similar to internal vane type of dam recommended by Luigi Figari as early as 1900; examples of each type illustrated and discussed.

FLOOD CONTROL

California. Constructing Flood Control Channel, F. S. Bixby. *Excavating Engr.*, vol. 37, no. 2, Feb. 1943, pp. 78–80, 106, and 108. Construction procedure for excavating and lining Los Angeles Burbank-Western flood control channel, as carried out by Matich & Yeager (California), is described; 2,500-ft length of 24-in. steel pipe was salvaged from some forgotten utility nearby, and by draining channel into this pipe by means of small dams, river was by-passed and carried around contemplated construction; concrete pouring operations.

New Hampshire. New Hampshire Flood on June 14–15, 1942, C. C. McDonald. *Boston Soc. Civ. Engrs.—J.*, vol. 30, no. 1, Jan. 1943, pp. 1–22, 4 supp. sheets. New Hampshire flood of June 14–15, 1942, ranks as major flood, especially in very limited area covered by center of storm where total of over 9 in. of rain fell in 12 hours; report makes available data regarding this storm and flood that followed.

FLOW OF FLUIDS

Weirs, Submerged. Submergence Effect on Sharp-Crested Weirs, J. K. Vennard and R. F. Weston. *Eng. News-Rec.*, vol. 130, no. 22, June 3, 1943, pp. 814–816. Data on five outstanding hydraulic workers are compared and graphs simplifying calculations for determining discharge over sharp-crested weirs made available; two important problems in using weirs to measure open channel flows are eliminated, and use of lengthy formulas is avoided. Bibliography.

FOUNDATIONS

Bridge Piers. Fighting Water in Bridge Foundation. *Eng. News-Rec.*, vol. 130, no. 22, June 3, 1943 pp. 806–810. Water flowing into sheet-pile cofferdams through honeycombed limestone bedrock delayed completion of piers for Bowling Green bridge in Kentucky nearly a year; after several schemes proved unsuccessful, cement grouting was found effective; illustrated description of methods employed.

Bridge Piers. Mexican Bridge Has Unique Foundations. *Eng. News-Rec.*, vol. 130, no. 18, May 6, 1943, pp. 688–680. Two piers for Mexican railroad bridge are being constructed as reinforced concrete caps supported several feet above stream bed on concrete piles; one of piers will support outer end of uncommon 62-ft movable plate-girder span, which pivots on closed box-type abutment; other will be middle pier for two-span continuous girder.

Pile. Steel-Shell Piles for Unusual Foundation, H. T. Immerman. *Eng. News-Rec.*, vol. 130, no. 22, June 3, 1943, pp. 801–802. Open-end piles driven 105 ft through muck and sand to hardpan, and cleaned out by washing and blowing with air jet, were employed to provide support for 1,300-ton coal unloading dock; piles for minor structures were driven only part way through sand stratum over soft clay and additional bearing, where required, was obtained by using more piles rather than by extending their length.

Soil Surveys. Preliminary Survey for Foundations, R. R. Minikin. *Civ. Eng.* (London),

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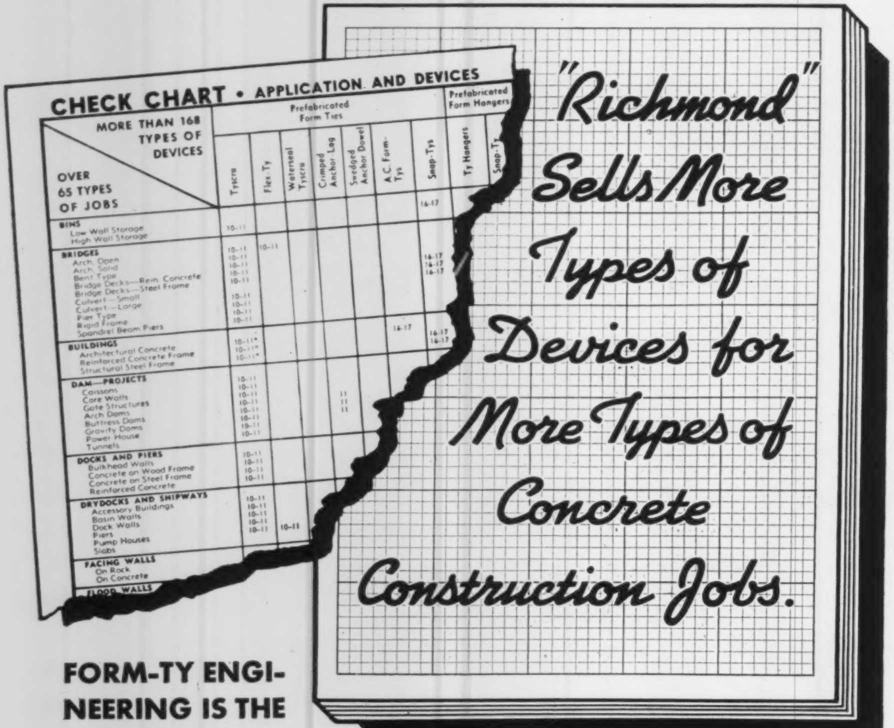
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TIME AND LABOR SAVING CONSTRUCTION DEVICES FOR CONCRETE CONSTRUCTION

vol. 38, no. 440, Feb. 1943, pp. 29–30. Boring operations are outlined and suitable auxiliary boring appliances discussed.

SOIL MECHANICS. Introduction to Soil Mechanics, W. L. Lowe-Brown. *Engineer*, vol. 175, nos. 4543, 4544, and 4545, Feb. 5, 1943, pp. 104–106; Feb. 12, pp. 124–126; and Feb. 19, pp. 144–146. Brief account of subject in simple language; internal friction and cohesion; stability of earth slopes; retaining walls; compression and consolidation of cohesive material; Terzaghi's fundamental research; compression curve; consolidation; foundations and settlement; pile and loading tests; dams and weirs on permeable foundations.

HYDRAULIC ENGINEERING

HYDRAULICS, RESEARCH. Recent Hydraulic Laboratory Developments, J. B. Tiffany, Jr. *Military Engr.*, vol. 35, no. 309, Mar. 1943, pp. 134–140. Recent developments at hydraulic laboratory, U.S. Waterways Experiment Station at Vicksburg, Miss., as follows: wave force against breakwaters; power tunnel model study; operation of pumps for draining drydocks; cavitation on baffle piers; penstock study; locations of breakwaters in harbors; salt water intrusion in river.

HYDROLOGY AND METEOROLOGY

RAIN AND RAINFALL, NEW ENGLAND. Rainfall in New England: Rainfall in Massachusetts, G. V. White. *New England Water Works Assn.—J.*, vol. 56, no. 4, Dec. 1942, pp. 405–502. Tabular data given; maximum and minimum monthly and yearly rainfalls and their year of occurrence are given for each station prior to 1929; except for comparatively new stations or occasional revised record, period of record is 1929 to 1941, inclusive, and monthly and annual averages are given for this period for each station through year 1938.

SEISMOGRAPHS. Film-Recording Seismograph. *Electronics*, vol. 16, no. 5, May 1943, pp. 89–92. Relations between earthquakes and large dams are being studied with special Benioff electromagnetic seismographs sensitive enough to record lowest levels of earth unrest; radio and electronic circuits make possible high degree of accuracy.

INLAND WATERWAYS

FISHWAYS. Fishways Problems on Quebec Rivers, P. E. Nobbs. *Eng. J.*, vol. 26, no. 4, Apr. 1943, pp. 202–207, (discussion) 207–209. General considerations; types of fishway; design of pool and notched overfall fishway for wood construction; present procedure and improved legislation; storage and hydroelectric dams; diagrams given. Bibliography. Before Eng. Inst. Canada.

RIVERS, IMPROVEMENT. Hydro Power, Navigation and Irrigation for Prairie Provinces Should Receive Support from Dominion, J. R. MacNicol. *Eng. & Contract. Rec.*, vol. 56, no. 16, Apr. 21, 1943, pp. 18–20, 27–28; see also *Elec. News*, vol. 52, no. 10, May 15, 1943, pp. 22–24, 232. Outline of suggested postwar undertaking to include rehabilitation of Saskatchewan River for water conservation, power production, navigation, and irrigation.

IRRIGATION

MALARIA CONTROL, INDIA. Measures for Control of Malaria in India, S. R. Christophers. *Roy. Soc. Arts.—J.*, vol. 91, no. 4638, Apr. 30, 1943, pp. 285–295, (discussion) 295–296. Irrigation, malaria; malaria of small towns; malaria of great cities of industry and engineering and of civil and military life in India; reclamation operations; malaria control in Delhi and Assam.

RICE GROWING. Utilidad Debida al Riego en el Cultivo del Arroz Segun Distintas Formas de Aprovechamiento, J. Garcia Montes. *Sociedad Cubana de Ingenieros—Revista*, vol. 38, no. 1, Jan. 1943, pp. 22–83. Results due to irrigation in rice growing, according to different forms of supply; derivation dams on rivers with regular flow; supply pumped from rivers; utilization of superficial beds of ground water, reaching roots, and controlling them by means of gates at outlets of drains; pumping from wells; construction of impounding dams; detailed discussion; cost data.

LAND RECLAMATION AND DRAINAGE

AIRPORTS. Multiple-Box Drain for Airbase Runoff. *Eng. News-Rec.*, vol. 130, no. 18, May 6, 1943, pp. 678–681. Construction of long, reinforced concrete box drain of 600 cu ft per sec; capacity at airbase was carried forward in alternate 75-ft sections; floating forms of all-bolted type were used, and two pours were required for each section, one as bottom slab and second as sidewalks and roof; concrete, which was mixed by paver, was delivered by 1-cu yd bucket handled by crawler crane.

CULVERTS. Earth-Loading Factors Affecting Field Installations of Culverts, G. A. Tilton, Jr., and R. L. Thomas. *Calif. Highways & Pub. Works*, vol. 21, nos. 3–4, Mar.-Apr. 1943, pp. 6–11. Presentation of factors affecting field installation and structural stability of culverts without benefit of mathematical analysis. Bibliography.

REFUSE DISPOSAL, LAND FILL. Sanitary Fill Experience at San Francisco. *Eng. News-Rec.*, vol. 130, no. 16, Apr. 22, 1943, pp. 554–557. For 10 years sanitary fill has been operated on shore of San Francisco Bay, making disposal of some 650 tons per day; rate of fill settlement, equipment selected for economical operation, characteristics of exposed face, and technique of cover placement have all had constant, expert attention; observations and conclusion recorded.

MATERIALS TESTING

BUILDING MATERIALS, PERMEABILITY. Tests of Cement-Water Paints and Other Waterproofing Unit-Masonry Walls, C. C. Fishburn and D. E. Parsons. *U.S. Bur. Standards—Bldg. Matls. & Structures—Report* no BMS95, Mar. 15, 1943, 37 pp. 15 cents. Wall specimens built of concrete blocks or of bricks were treated with cement water paints or with other waterproofings; effectiveness of treatments was measured by comparing permeability of walls, before and after treatment, when they were subjected to conditions simulating wind driven rain; results presented.

CONCRETE AGGREGATES, CHERT. Study of Chert as Deleterious Constituent in Aggregates, H. S. Sweet and K. B. Woods. *Purdue Univ.—Eng. Experiment Station—Research Series No. 86*, vol. 26, no. 5, Sept. 1942, 111 pp. Investigation, conducted by Bureau of Materials and Tests, State Highway Commission of Indiana, and Joint Highway Research Project, is divided into two parts: Indiana limestone quarry cherts and Indiana gravel cherts; various definitions of chert and theories concerning its mode of formation reviewed; work of previous investigators studied and conclusions reported.

CONCRETE, PROPERTIES. Properties of Porous Concrete of Cement and Uniform Sized Gravel, P. H. Petersen. *U.S. Bur. Standards—Bldg. Matls. & Structures—Report No. BMS 96*, Mar. 18, 1943, 15 pp, 10 cents. Physical properties of porous concrete consisting solely of portland cement, water, and uniform-sized gravel were investigated; compressive, transverse, shearing, and bond strengths are reported as well as resistance to heat transfer, water penetration by capillarity, and rain penetration.

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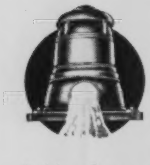

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JOINTS, WOODEN. Strength of Nailed Plywood Joints Subjected to Lateral Loading. *Eng. News-Rec.*, vol. 130, no. 18, May 6, 1943, pp. 691–693. Tests to destruction with lateral loads on plywood of different thicknesses were made as basis for tabulations of relative strength of joints, using nails of various sizes; materials and conditions of tests, made to conform closely to usual field practice and results indicate that factor of safety of about five is permissible.

PORTS AND MARITIME STRUCTURES

FISHERIES. Influence of Harbours Upon Inshore Fisheries, E. Hardy. *Dock & Harbour Authority*, vol. 23, no. 270, Apr. 1943, p. 289. Importance of wartime fisheries; Mersey fisheries; effect of river pollution; influence of harbor structures.

SHIPYARDS, SAN FRANCISCO. Tideland Shipyard, W. Williams. *Excavating Engr.*, vol. 37, no. 3, Mar. 1943, pp. 130–131, 157. Details pertaining to construction of shipyard being used for building concrete ships on San Francisco Bay peninsula.

ROADS AND STREETS

AIRPORT RUNWAYS. Analyzing Design of Airport Runways, C. K. Stephens. *Am. City*, vol. 58, no. 4, Apr. 1943, pp. 81 and 83. Article deals with question: should principles of highway design be used on airport runway construction; airport and highway traffic; plane speed and runway loading; drainage studies; unit load design recommended; flexible runways preferred; soil studies advocated; need for airports great.

CAMOUFLAGE. Camouflage Planting, M. Sewell. *Am. City*, vol. 58, no. 4, Apr. 1943, pp. 52–54. Intelligent tree planting for camouflage will produce permanent assets; cooperative task for architects and landscape architects; screening roads and parking spaces; pine family preferred for groves; transplanting job; willows for camouflage screening; spacing for planting.

CONSTRUCTION. Highway Improvement Completed from Bradley to King City via Jolon, A. N. Lund. *Calif. Highways & Pub. Works*, vol. 21, nos. 3–4, Mar.-Apr. 1943, pp. 3–5 and 20. Original route of El Camino Real has been reestablished from Bradley to King City via Jolon during past year by construction of 40 miles of highway; project was divided into five units for construction; erosion prevention; excavation in shale; construction methods; earth berms.

CONSTRUCTION. Progress Changes Oregon Trail. *Excavating Engr.*, vol. 37, no. 4, Apr. 1943, pp. 176–178 and 180. Construction of Shasta Dam necessitated relocation of modern concrete highway, U.S. 99, and railroad formerly on path of historic Oregon Trail in California's Central Valley region; plans to restore navigation; Central Valley Project; federal adoption of project; four primary benefits; development of grade separations.

CONSTRUCTION. Road Building in 1942. *Roads & Road Construction*, vol. 21, no. 243, Mar. 1, 1943, pp. 85–86. Demands of global war for highways to expedite movements of great armies; greater postwar road traffic; road building in Africa and Persia

GREAT BRITAIN. Britain's Need for Roads, B. Bowman. *Liverpool Eng. Soc.—Bul.*, vol. 16, no. 3, Oct. 1942, pp. 4, 7–8, 11–14, 16, 18, 20, and 22. Details pertaining to road system of Great Britain; part played by road transport in country's national life; traffic problems encountered; recent reports of Scott Committee on Land Utilization in Rural Areas, and Uthwatt Expert Committee on Compensation and Betterment.

HIGHWAY SYSTEMS, ALASKA. Alaska Military Highway, C. L. Sturdevant. *Eng. J.*, vol. 26, no. 3, Mar. 1943, pp. 117–121. Construction of highway to Alaska; route connects series of airfields from Fort St. John, B.C., to Big Delta on Richardson Highway in Alaska; mobilization and tasks; supervision; equipment; operations; rate of progress. Before Eng. Inst. Canada.

HIGHWAY SYSTEMS, ALASKA. Role of P.R.A. and Its Contractors in Construction of Alcan Highway, T. E. MacDonald, L. I. Hewes, and J. S. Bright. *Pac. Bldr. & Engr.*, vol. 49, no. 4, Apr. 1943, pp. 36–42 and 44–45. Paper presents view of operations on Alcan Highway from standpoint of Public Roads Administration; it is largely progress report, covering two distinct phases of construction operations by Public Roads Administration in 1942. Before Am. Soc. Civ. Engrs.

HIGHWAY SYSTEMS, CENTRAL AMERICA. Overland Transport to Central America, E. W. James. *Highway Mag.*, vol. 34, May-June 1943, pp. 52–55. Constructional details pertaining to Inter-American Highway in Central America.

HIGHWAY SYSTEMS, POSTWAR. Postwar Highways, G. D. Kennedy. *Am. Highways*, vol. 22, no. 2, Apr. 1943, pp. 19–21. Forecast of conditions: war needs must be met first; preparing for reconversion; three immediate steps suggested; appraisal of postwar conditions; replacement job will be biggest; developments in air travel; farm products must be moved; high

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productivity will be essential. Before Assn. Highway Officials, North Atlantic States.

Maintenance and Repair. County Aids Townships, R. M. Cameron. *Better Roads*, vol. 13, no. 5, May 1943, pp. 11–13. Montgomery County, Pennsylvania, has developed unusual plan of county aid to townships and other local units for highway improvement, which is much more comprehensive than anything found in any other Pennsylvania county; detailed description of plan.

Maintenance and Repair. Low-Cost Oil Aggregate Paving in Mishawaka, Indiana, F. J. Miller. *Pub. Works*, vol. 74, no. 5, May 1943, pp. 11–13. Dust nuisance of 75 miles of gravel streets remedied by laying oil aggregate mixture, which provides smooth, dustless, easy-riding surface; laid by WPA workmen, most of them inexperienced; some material is used for patching.

Maintenance and Repair. Old Concrete Slab Salvaged for New Road, C. A. Rothrock. *Eng. News-Rec.*, vol. 130, no. 18, May 6, 1943, pp. 671–674. In changing two-lane road into dual-lane divided highway, new 6-in. non-reinforced slab was placed directly on old concrete after surface of this slab had been treated to eliminate bond between old and new construction; because of increased width and different center line with new work, special construction was required beyond old slab.

Maintenance and Repair. Wartime Highway Improvement Affected by Men, Materials, Machinery and Money, S. C. Hadden. *Am. Highways*, vol. 22, no. 2, Apr. 1943, pp. 15–18. Review of present situation; problems involved are discussed. Before Miss. Valley Conference.

Postwar. Postwar Reconstruction, W. Garbutt. *Roads & Road Construction*, vol. 21, no. 243, Mar. 1, 1943, pp. 68–70. Possible effects on responsibilities of highway authorities and engineers; administration; position of highway engineer; street lighting; design of tree and shrub planting. Before Instn. Highway Engrs.

Slide Rules. Device Aids Embankment Control, C. W. Allen. *Better Roads*, vol. 13, no. 5, May 1943, pp. 14–15. Circular slide rule developed in laboratory of Ohio State Department of Highways has facilitated use of typical moisture density curves in control of embankment compaction in field.

Subsoils. Highway Subgrades, C. C. Newlin, Jr. *Rose Technic*, vol. 53, no. 2, Mar. 1943, pp. 9 and 26–29. Author discusses subgrade surface or soil beneath highways and its effect upon wearing surface; properties of soils which affect subgrade; tests given subgrade soils; effect of subgrade on wearing surface; classification and identification of subsoils; preparation of subgrade.

Widening. Grapevine Grade Widened to 4-Lane Highway with Center Safety Barrier and Drainage Features, E. T. Scott. *Calif. Highways & Pub. Works*, vol. 21, nos. 3–4, Mar.-Apr. 1943, pp. 1–2 and 20. Manner in which hazardous stretch of highway, Grapevine Grade, on U.S. Route 99, between Los Angeles and Bakersfield, has been widened; drainage operations.

SANITARY ENGINEERING

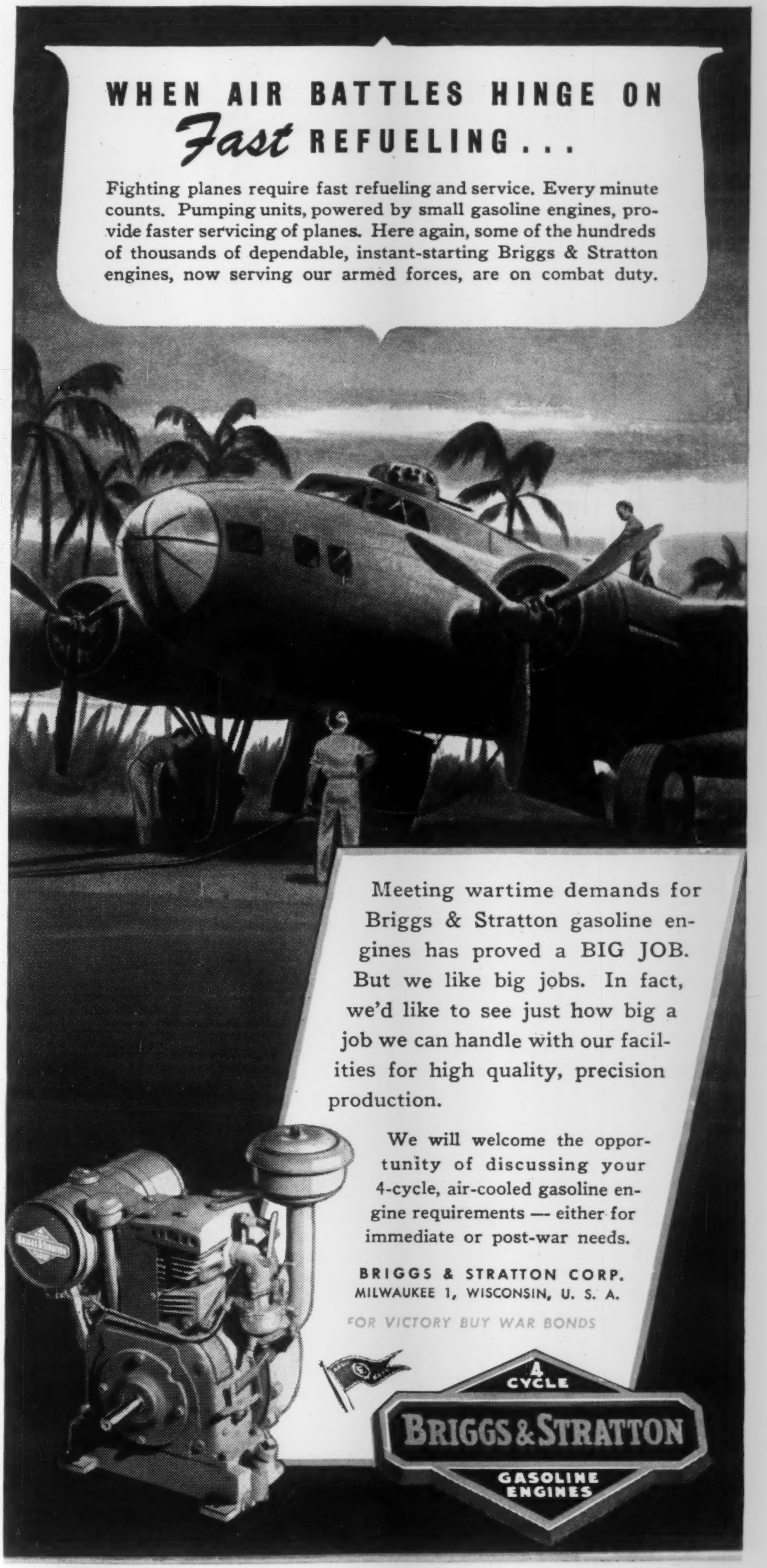
Florida. Wartime Acitvities of Bureau of Sanitary Engineering of Florida State Board of Health, J. B. Miller. *Am. Water Works Assn.—J.*, vol. 35, no. 2, Feb. 1943, pp. 196–198. Report of activities is closely allied with cooperation of military forces interested in municipal supplies close to military areas; standard practice for submission of water samples for bacterial analysis has been inaugurated; main sterilization work and training of emergency crews discussed.

SEWERAGE AND SEWAGE DISPOSAL

Activated Sludge. Studies on Activated Sludge Process at Two Rivers, Wisconsin, C. N. Sawyer and G. A. Rohlich. *Sewage Works Eng. & Mun. Sanitation*, vol. 14, no. 5, May 1943, pp. 234–238. Changes required in plant facilities for experimental studies on "stage addition" of activated sludge; preliminary studies prior to stage addition; investigation of stage addition of return sludge; back flow in aerators important factor; other results of interest to sanitary engineers. (Concluded.)

Disposal Plants, Cranston, R.I. Up-To-Minute Cranston, R.I., Sewage Disposal Plant and Sewerage System, R. W. Horne. *Pub. Works*, vol. 74, no. 5, May 1943, pp. 20–23, 40, and 42–43. Description of 5.5-mgd activated-sludge plant, comprising mechanically cleaned grit-removal unit, comminutor, grease-removal unit, primary settling tanks, aeration tanks, final settling tanks, chlorinators, tanks for sludge concentration, digestion and elutriation, vacuum filters, and incinerator.

Disposal Plants. Grit Chambers. Air Lift Pump Used to Clean Sewage-Disposal Grit Chambers. *Eng. News-Rec.*, vol. 130, no. 16, Apr. 22, 1943, p. 557. Air-lift pump and special arrangement of piping have been found decided improvement in methods of washing and removing grit from grit chamber of Olean (N.Y.) sewage disposal plant; arrangement of pump and piping shown.



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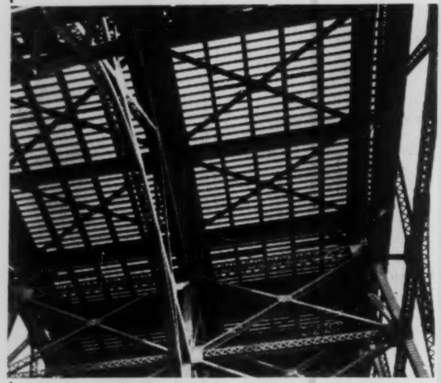

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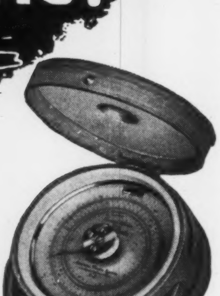

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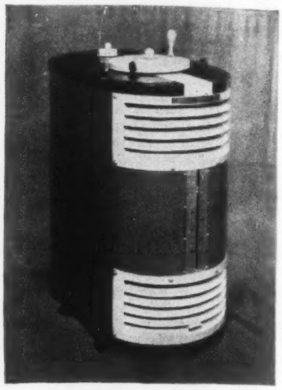

A desirable feature of this welder is an "idlematic" control which automatically reduces the output voltage to less than 35 volts whenever the arc is not in operation, but provides full power for welding the instant the arc is struck. This control also includes a switch operated by a handle extending through the top of the case for starting or stopping manually.

The welder is protected against the entrance of rain, snow, and sleet by drip-proof construction of all openings in the top of the case and by a sealed window over the current indicator. Wide louvers serve not only to shed water but to keep air velocity low. All internal parts have a special finish for protection against corrosion from moist air.

In addition, the welder is provided with all the desirable features incorporated in General Electric indoor a-c welders. These include built-in power-factor improvement which provides low current input by maintaining the power factor at 95 per cent or better at all loads between 40 and 70 per cent of rating. They also include finger-tip adjustment, stepless current control, fan-forced ventilation, and capacity for operation with long leads.

Construction Guide

REQUIREMENTS for construction projects should be in line with the revised version of the "Critical Construction Materials Design Guide" prepared by the Conservation Division, the War Production Board announced recently.

Formal instructions to this effect are incorporated in Form WPB-617, formerly PD-200. The following statement appears in the Application for Authority to Begin Construction pursuant to order L-41: "Applicants must be guided by the 'Directive for Wartime Construction' as well as by 'Critical Construction Materials Design Guide' of the War Production Board."

Outlining the items of construction which are permitted by WPB for projects approved as essential to the war effort, the Guide is designed to assist engineers and

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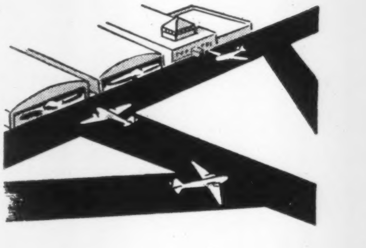

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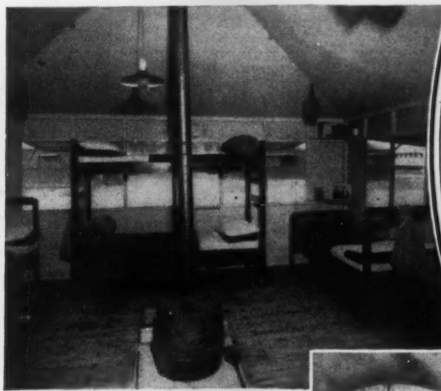

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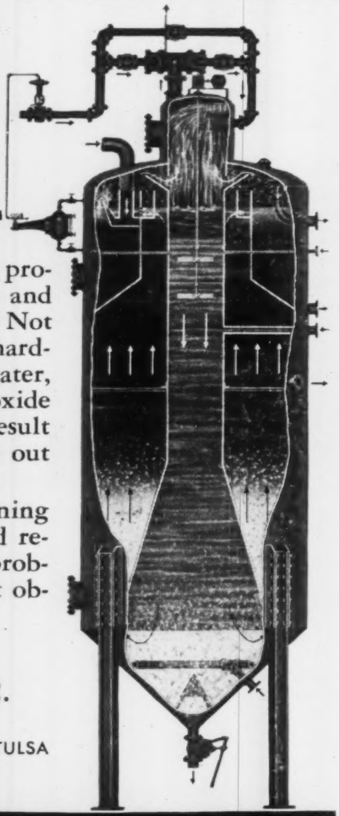

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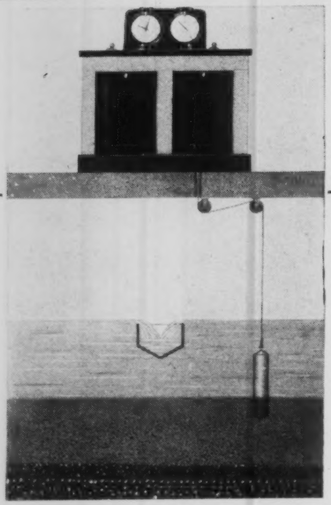

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architects who are responsible for planning proposed projects. If the policies as stated in the Guide are maintained in the selection of materials, the work of processing the applications will be greatly reduced and final action will be expedited.

Excepted from the scope of projects to which the Guide applies are the following classifications: housing projects, which are governed by the War Housing Critical List; command construction projects, which are certain military projects ordered by the Chief of Staff, U.S. Army, or by the Chief of Naval Operations, U.S. Navy, and construction projects for which the Army, Navy, and Maritime Commission are the claimant agencies under the Controlled Materials Plan. Both of the latter types of construction are governed by the Army and Navy Munitions Board "List of Prohibited Items for Construction Work."

Copies of the Guide may be obtained from the Regional or District Offices of the War Production Board or from the WPB Conservation Division, 1100 H Street, N.W., Washington 1, D.C.

Literature Available

CLUTCH—The principle of the Fawick Airflex Clutch, its advantages, and its operation are very clearly and concisely outlined in Bulletin 200. Included in this 24-page bulletin are sectional drawings of the clutch, both expanding and constricting types, of the combined clutch and brake, and of the clutch pulley. Proofs of efficiency are shown in captioned illustrations of Airflex units on all types of machines and equipment in a wide range of industries. Fawick Airflex Co., 9919 Clinton Ave., Cleveland, Ohio.

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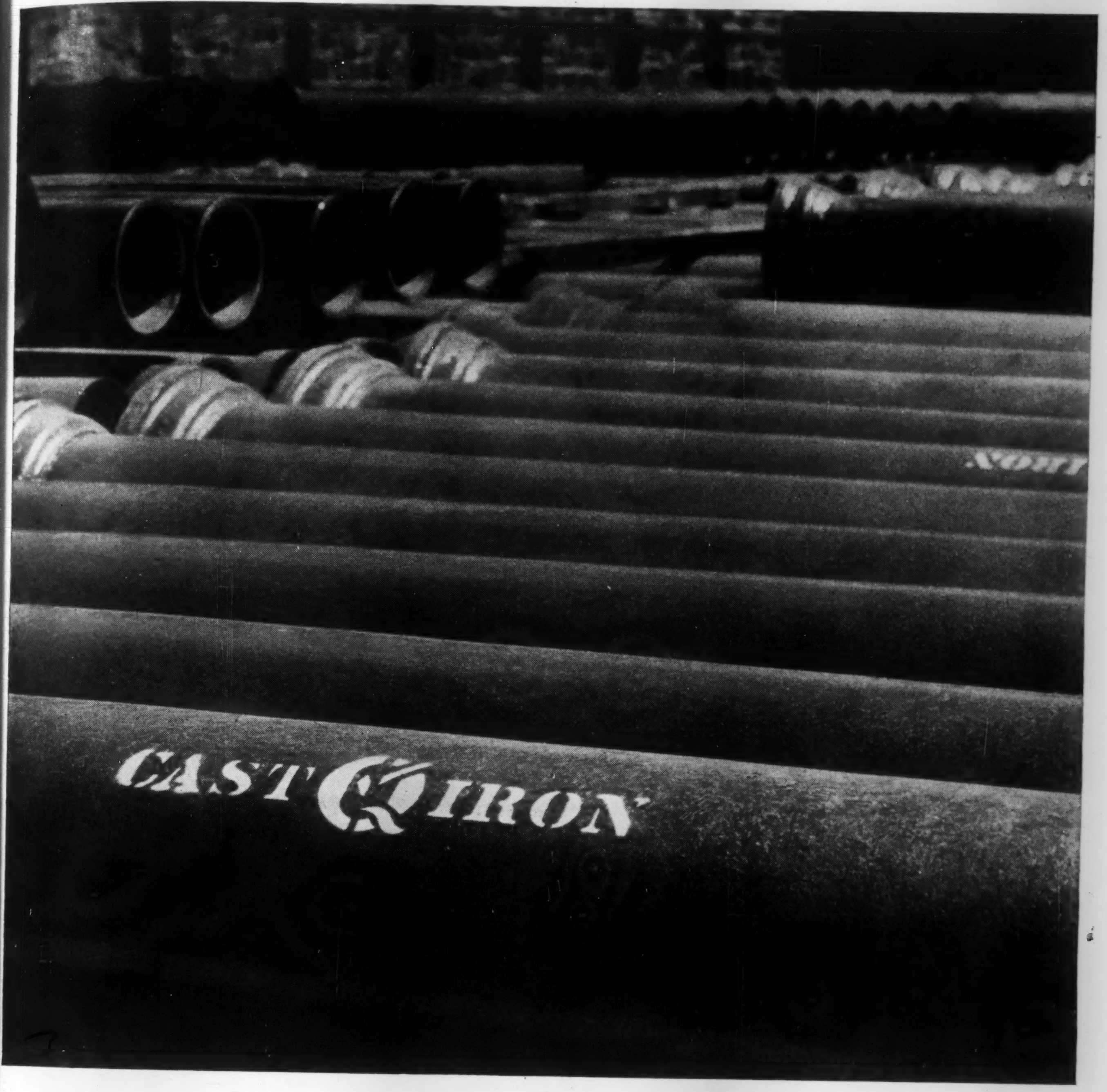

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REINSTATEMENTS

AHLERS, JOHN GORDON, M., reinstated July 12, 1943.

CALDWELL, WILLIAM WEBSTER, Assoc. M., reinstated July 14, 1943.

MOORE, BYRD LEE M., reinstated July 21, 1943.

VAN WERT, EARL CLINTON, Assoc. M., reinstated Aug. 6, 1943.

WESTCOTT, CLIFFORD HARPER, M., reinstated July 16, 1943.

RESIGNATIONS

LONGSHORE, RICHARD LIPKEY, M., resigned July 15, 1943.

MORELAND, RUSSELL EARL, Jun., resigned July 9, 1943.

PLETTA, DAN HENRY, Assoc. M., resigned July 9, 1943.

STEDJE, JOHN JAY, Assoc. M., resigned July 15, 1943.

Applications for Admission or Transfer

Condensed Records to Facilitate Comment from Members to Board of Direction

SEPTEMBER 1, 1943 NUMBER 9

The Constitution provides that the Board of Direction shall elect or reject all applicants for admission or for transfer. In order to determine justly the eligibility of each candidate, the Board must depend largely upon the membership for information.

Every member is urged, therefore, to scan carefully the list of candidates published each month in CIVIL ENGINEERING *and to furnish the Board with data which may aid in determining the eligibility of any applicant.*

It is especially urged that a definite recommendation as to the proper grading be given in each case, inasmuch as the grading must be based upon the opinions of those who know the applicant personally as well as upon the nature and extent of his professional experience. Any facts derogatory to the personal character or professional reputation of an applicant should be promptly communicated to the Board.

Communications relating to applicants are considered strictly confidential.

The Board of Direction will not consider the applications herein contained from residents of North America until the expiration of 30 days, and from non-residents of North America until the expiration of 90 days from the date of this list.

MINIMUM REQUIREMENTS FOR ADMISSION

GRADE	GENERAL REQUIREMENT	AGE	LENGTH OF ACTIVE PRACTICE	RESPONSIBLE CHARGE OF WORK
Member	Qualified to design as well as to direct important work	35 years	12 years	5 years RCM*
Associate Member	Qualified to direct work	27 years	8 years	1 year RCA*
Junior	Qualified for subprofessional work	20 years	4 years	
Affiliate	Qualified by scientific acquirements or practical experience to cooperate with engineers	35 years	12 years	5 years RCM*

* In the following list RCA (responsible charge—Associate Member standard) denotes years of responsible charge of work as principal or subordinate, and RCM (responsible charge—Member standard) denotes years of responsible charge of IMPORTANT work, i.e., work of considerable magnitude or considerable complexity.

APPLYING FOR MEMBER

ALLEN, HARVEY HICKS (Assoc. M.), Albuquerque, N.Mex. (Age 42) (Claims RCA 4.2 RCM 8.9) Aug. 1942 to May 1943 Capt., and May 1943 to date Major, Corps of Engrs., U.S. Army; previously Paving Engr., U.S. Army Engrs., Albuquerque, N.Mex. Dist.; with Texas Highway Dept. in various capacities.

BANKS, THOMAS GRAY (Assoc. M.), Dayton, Ohio. (Age 56) (Claims RCA 13.0 RCM 19.5) April 1939 to date with U.S. War Dept., Fort Sill, Okla., successively as Senior Inspector and Engr., Associate Engr., and since Oct. 1941 Engr., and at present with Air Service Command, Dayton; previously in private practice.

BANTA, ARTHUR PERRY (Assoc. M.), Spring Hill, Ala. (Age 39) (Claims RCA 9.6 RCM 7.6) April 1941 to date with Corps of Engrs., U.S. Army, as Lt., Capt., and (at present) Major; previously with Los Angeles County San. Dists., as Asst. Engr. and San. Engr.

CALDWELL, WILLIAM WEBSTER (Assoc. M.), New York City. (Age 43) (Claims RCA 22.4) Jan. 1938 to date Vice-Pres. and Gen. Mgr., Iglehart, Caldwell & Scott, Inc., Bldg. Constrs.; previously with J. G. White Eng. Corporation.

CLAIR, MILES NELSON (Assoc. M.), Newton, Mass. (Age 42) (Claims RC 20.9 D 6.4) July 1925 to date Testing and Designing Engr. to Vice-Pres. and Treas., The Thompson Lichtner Co., Inc.

CLARKE, FRANK TACKETT, Sulphur, La. (Age 46) (Claims RCA 1.0 RCM 7.2) June 1942 to date Chf. Civ. Engr., The Union Sulphur Co., Inc.; previously with Louisiana Dept. of Highways.

DANDROW, CHARLES GEORGE, New York City. (Age 44) (Claims RCM 18.5) 1936 to date New York Dist. Mgr., Power Products & Iudustrial Dept., Johns-Manville Sales Corporation.

DES ISLETS, ROBERT EUGENE MOUSSEAU, Kansas City, Mo. (Age 40) (Claims RCM 10.7) July 1926 to date with Corps. of Engrs., U.S. Army in various capacities, since Jan. 1943 being Dist. Engr., Kansas City Dist.; at present Colonel.

DODGE, HARLAND PRAY, Saginaw, Mich. (Age 46) (Claims RCA 7.6 RCM 10.2) July 1941 to Feb. 1942 and Jan. 1943 to date San. Engr., The Francis Eng. Co.; in the interim Chf. Designing Engr., Civil Utilities, The J. L. Simmons Co., Inc., and Hazelet & Erdal; previously with City of Ann Arbor, Mich., in various capacities, finally as San. Engr. and Supt. of Sewage Treatment.

ENGLE, ARTHUR DELAP, Oklahoma City, Okla. (Age 52) (Claims RCA 2.0 RCM 18.0) 1920 to date Asst. to Chf. Engr., The Austin Co. Cleveland; also Vice-Pres. and Chf. Engr. of work in China (1933 to 1936), Director of Research (1936), and Chf. Project Engr. (1941 to 1942), and Project Mgr. and Chf. Project Engr. (1942 to date).

GRAY, CHESLEIGH, Indianapolis, Ind. (Age 57) (Claims RCA 2.1 RCM 25.3) June 1939 to date Vice-Pres., Gen. Mgr., and Part Owner, Ready Mixed Concrete Corporation; previously Dist. Mgr., American Aggregates.

HAMLIN, CLARENCE ALBERT, Springfield, Ill. (Age 46) (Claims RCA 2.5 RCM 15.9) May 1941 to date Major, U.S. Army, Field Artillery; previously with Illinois Div. of Highways, as Jun. Highway Engr. and Asst. Highway Engr.

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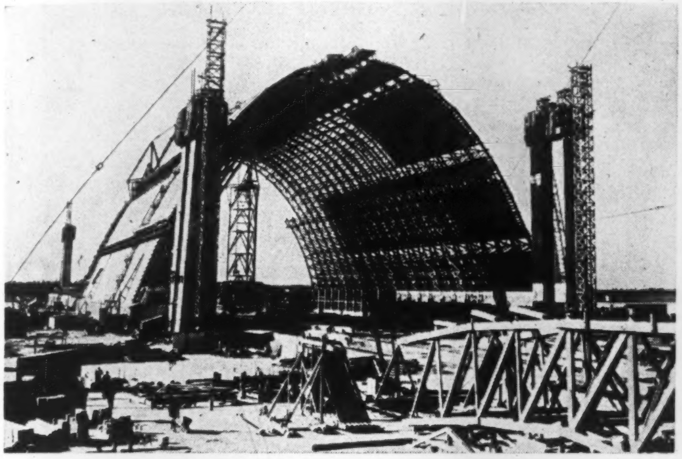

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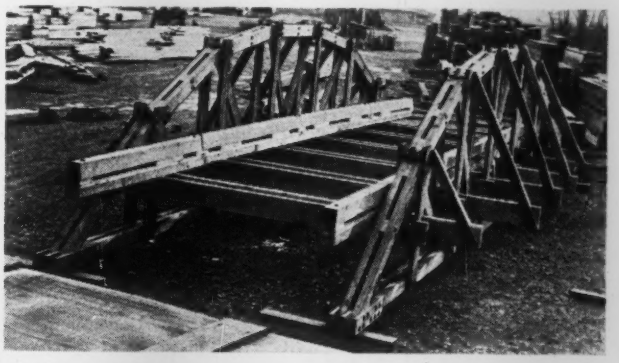
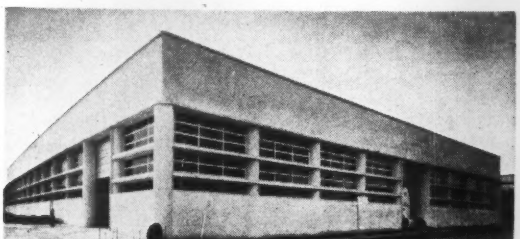


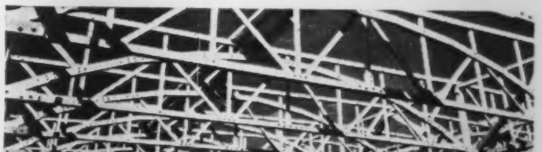
PAN-AMERICAN HIGHWAY. Bridges like this (50′-70′-90′ lengths) were completed and shipped by Timber Structures, Inc. 18 days after order was received—15 days ahead of schedule One bridge of each size was given a trial assembly for inspection purposes, then creosoted at Pope-Talbot plant, St. Helens, Oregon. Bridges designed by U. S. Engineers.

●



WAREHOUSE, 200′x300′ for Woodbury and Co., Portland, Ore. Roof trusses for this modern building designed, fabricated and erected by Timber Structures, Inc. Architect: Richard Sundeleaf, Portland. Contractor: Wegman & Son, Portland. Miles K. Cooper, Portland, Structural Engineer.

PLYWOOD PLANT, Peninsula Plywood Corp., Port Angeles, Wash. 90-64′ trusses were provided. Engineer: J. H. Stevenson. Contractor: A. S. Hainsworth Const. Co., Seattle.



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Address ______________________

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If *west* of the Mississippi, send to Portland 8, Oregon. If *east* of the Mississippi, send to 535 Fifth Avenue, New York 17, N. Y.

Harris, Robert Otis (Assoc. M.), Mobile, Ala. (Age 47) (Claims RCA 6.5 RCM 7.4) Dec. 1941 to date with U.S. Engr. Dist. Office, as Associate Engr. (Civ.), Engr. (Civ.), and (since June 1943) Chf. in charge of Paving, Grading and Drainage Sec.; previously with Alabama Highway Dept. in various capacities.

Hart, John Maurice, Cincinnati, Ohio. (Age 37) (Claims RCA 4.6 RCM 4.1) Aug. 1936 to date with U.S. Engr. Dept., in various capacities, since Nov. 1942 as Associate Engr. (Civ.).

Horner, Edwin Arno, New York City. (Age 44) (Claims RCA 4.3 RCM 8.2) 1942 to date Structural Squad Chf., Nicaro Nickel Co.; previously Architectural Group Chf. with Caribbean Archt.-Engr.; Architectural Squad Chf., Arch. Roof Constr. Co., New York City.

Joslin, De Forest Funk, Topeka, Kans. (Age 40) (Claims RCA 1.3 RCM 15.0) March 1927 to date Supt., Eng. Dept., Security Benefit Home & Hospital Association, Topeka, at present also Member, Board of Trustees.

Kennedy, Harry, Midland, Mich. (Age 46) (Claims RCM 9.5) 1934 to date with The Austin Co. in various capacities, since 1942 as Asst. Project Engr. in complete charge of engineering room, DPC No. 477, Midland, Mich.

Kohnen, Edward, Baltimore, Md. (Age 50) (Claims RCA 5.9 RCM 13.5) 1931 to date with The Arundel Corporation, Contrs., Baltimore, Md., since June 1942 as Chf. Engr.

Lame, Herman Fox, Washington, D.C. (Age 57) (Claims RCA 8.8 RCM 22.5) May 1942 to date Consultant to engineers on shipyard design and facilities; previously Chf., Plant Eng. Sec., U.S. Maritime Comm., Washington, D.C.; general engineering and consulting practice, Albany, N.Y., and Cons. Valuation Engr. (Structural) for Public Service Comm. of New York State.

Myers, Harry Edward, Gadsden, Ala. (Age 34) (Claims RCA 3.3 RCM 5.6) Nov. 1940 to date Chf. of Operations, J. B. Converse & Co., Inc., and A. C. Polk; previously Prin. Asst. Engr., J. B. Converse & Co., Inc.

Pavlo, Emanuel Lionel, Rye, N.Y. (Age 37) (Claims RCA 1.0 RCM 7.2) May 1934 to date with Madigan-Hyland, Cons. Engrs., as Designer-Draftsman, Asst. Chf. Engr., and (since Jan. 1942) Chf. of Eng. and Chf. Engr.

Purcell, Charles Henry (Assoc. M.), Sacramento, Calif. (Age 60) (Claims RCA 3.0 RCM 30.5) 1928 to date with State of California, until 1942 as State Highway Engr.; since 1931 Chf. Engr., San Francisco–Oakland Bay Bridge; since Jan. 1943 Director of Public Works.

Reece, Elliott Elphinstone, Port-of-Spain, Trinidad, B.W.I. (Age 46) (Claims RCA 3.8 RCM 14.7) May 1938 to March 1941 and Nov. 1942 to date in private practice; in the interim Chf. Inspector, U.S. Engr. Dept., Trinidad.

Ritter, Roy Horace (Assoc. M.), Towson, Md. (Age 39) (Claims RCA 5.0 RCM 7.7) Dec. 1934 to date Engr., Whitman, Requardt and Smith.

Salsbury, Markham Elmer (Assoc. M.), Pasadena, Calif. (Age 39) (Claims RCA 6.3 RCM 8.4) Aug. 1927 to date with Los Angeles County Flood Control Dist., successively as Designing Engr., Investigating Engr., Asst. Chf. Engr., and since March 1942 Acting Chf. Engr.

Sommerschield, Harold Ferdinand (Assoc. M.) Chicago, Ill. (Age 38) (Claims RCA 2.8 RCM 7.1) Oct. 1937 to date with Harza Eng. Co., as Structural Designer and Chf. Draftsman, Chf. Mech. and Civ. Designer, and (since April 1943) Designer, Planning Div.

Sopp, Claude Wellington (Assoc. M.), Los Angeles, Calif. (Age 49) (Claims RC 23.5 D 4.5) July 1922 to date Asst. Engr., Asst. Chf. Engr., and Asst. Chf. Engr. and Gen. Mgr., Pasadena (Calif.) Water Dept.

Upham, John Darr, Austin, Tex. (Age 36) (Claims RCA 2.7 RCM 5.4) 1939 to date with NYA in various capacities, since 1942 being Regional Director (Texas, Louisiana, and New Mexico), Div. of Operations; previously Office Engr. and Instrumentman, Texas Highway Dept.

Varker, William Metcalf, New York City. (Age 49) (Claims RCM 14.8) 1941 to date with Tuttle, Seelye, Place & Raymond, Archt.-Engrs., at present as Gen. Mgr.; previously Vice-Pres. and Director, 5 years with Management and Research, Inc. (Eng. Development Co.), and 4 years with Gilbert-Varker Corporation, Constrs.

Waugh, Hugh Lynne, New River, N.C. (Age 49) (Claims RCA 3.0 RCM 13.1) Jan. 1942 to date Chf. Structural Engr., Carr & J. E. Greiner, Baltimore, Md.; previously with Albert Kahn, Inc. ,Detroit, Mich.

Woods, Kenneth Brady (Assoc. M.), West Lafayette, Ind. (Age 38) (Claims RCA 3.1 RCM 7.7) Feb. 1939 to date Asst. Director, Joint Highway Research Project; also Associate Prof. of Highway Eng., Purdue Univ.; previously with Ohio Dept. of Highways, Bureau of Tests.

Ziegenfelder, Rush Field, Babylon, N.Y. (Age 39) (Claims RCA 7.3 RCM 5.6) May 1941 to date Chf. Draftsman, Parsons, Brinckerhoff, Hogan & Macdonald; previously Superv. Designer, Madigan-Hyland.

APPLYING FOR ASSOCIATE MEMBER

Angele, Gustave John, Guild, Tenn. (Age 37) (Claims RCA 2.3) April 1935 to date with TVA, Chattanooga, Tenn., in various capacities, since May 1943 being Asst. Field Engr. at Hales Bar Dam.

Bathe, George R., Omaha, Nebr. (Age 33) (Claims RCA 2.7 RCM 2.4) Oct. 1941 to date Field Engr., Structures and Housing, Portland Cement Association; previously Engr., Pittsburgh-Des Moines Steel Co., Des Moines, Iowa; Engr. and Mgr., Steel Div., Polenske Bros.-Shellak & Co., Hastings, Nebr.; Materials Inspector and Research Asst., Iowa Highway Comm.

Buettner, Charles Edward, St. Louis, Mo. (Age 41) (Claims RCA 5.1) July 1936 to date with Union Elec. Co. of Missouri as Tech. Engr. and Supervisor.

Chang, Quang Tou, Knoxville, Tenn. (Age 31) (Claims RCA 5.3) Dec. 1937 to date with National Resources Comm., Changshou, Szechuan, China, successively as Associate Engr., Engr. and Head of a project, and since March 1943 studying water-power development at TVA.

Clark, Roland Augustus (Junior), Baltimore, Md. (Age 31) (Claims RCA 3.0) March 1939 to date with Whitman, Requardt and Smith, Baltimore, since Sept. 1940 as Structural Engr. and Estimator; previously Drafting Supervisor, WPA project 7043, Baltimore.

Crabiel, Joseph Edward (Junior), Milltown N.J. (Age 27) (Claims RCA 2.1 RCM 0.4) June 1936 to date with Franklin Contr. Co., Newark, N.J., in various capacities, since March 1943 as Supt. of Highway Constr.

Friedkin, Joseph Frank, Vicksburg, Miss. (Age 33) (Claims RCA 2.4) May 1942 to date with U.S. Army, at present as 1st Lt. to Capt., Corps of Engrs.; previously with U.S. International Boundary Comm., in various capacities.

Frieling, Gerald Harvey, Kansas City, Mo. (Age 40) (Claims RCA 8.5 RCM 1.5) Aug. 1926 to date with Kansas City Public Service Co., in various capacities, since Jan. 1942 Director of Research.

Gillis, Charles Bernard, Los Angeles, Calif. (Age 50) (Claims RC 8.5 D 18.6) Nov. 1923 to date with Bureau of Eng., Los Angeles, since Nov. 1941 with San. Sewer Design Div.

Gould, Irvine Phillips (Junior), New York City. (Age 30) (Claims RCA 4.7 RCM 1.5) Feb. 1939 to date with Parsons, Brinckerhoff, Hogan & Macdonald, Engrs., as Res. Engr., and (since Jan. 1943) Designer.

Gregg, Lowell Edward (Junior), West Lafayette, Ind. (Age 27) (Claims RCA 2.1) June 1939 to date at Purdue Univ. as Graduate Student and Graduate Asst., and (at present) Research Engr., Joint Highway Research Project, Soils Laboratory Sec., Eng. Experiment Station; also Sept. 1940 to June 1941 Asst. Instructor of Civ. Eng. in Testing Materials.

Heft, George Albert (Junior), New Orleans, La. (Age 27) (Claims RCA 2.1 RCM 3.9) Nov. 1940 to July 1943 member of firm, Barnard, Godat & Heft, Cons. Engrs., New Orleans; previously Engr. of Design, Union Station Project, Dept. of Public Utilities, New Orleans.

Hostetter, Leon Alvin, Sacramento, Calif. (Age 41) (Claims RCA 2.4 RCM 6.1) Feb. 1934 to date with U.S. Engr. Office in various capacities, since April 1943 being Senior Civ. Engr., Sacramento, Calif.

Howard, George Wilberforce (Junior), Arlington, Va. (Age 32) (Claims RCA 3.7 RCM 1.0) Feb. 1941 to date with U.S. Army, Bridge Branch, Engr. Board, Ft. Belvoir, Va., as Capt., Major, and Lt. Col.

Ketchen, Lawrence Lindberg (Junior), Oakland, Calif. (Age 29) (Claims RCA 1.3 RCM 1.6) Nov. 1942 to date Structural Engr., Pacific Bridge Co., Shipbuilding Div., San Francisco, Calif.; previously Jun. Structural Engr., U.S. Naval Air Station, Quonset Point, R.I., then Asst. Structural Engr., U.S. Supply Depot, Clearfield, Utah; Senior Eng. Aide, Metropolitan Dist. Water Supply Comm.

Lillevang, Omar Johansen (Junior), Phoenix, Ariz. (Age 28) (Claims RCA 3.4) Aug. 1938 to date with Quinton, Code & Hill-Leeds & Barnard (later Leeds, Hill, Barnard & Jewett), as Jun. Engr., Office Engr., and Asst. Engr.

Lupine, Elmer Al Roy, Norfolk, Va. (Age 34) (Claims RCA 9.2 RCM 2.0) Dec. 1940 to date Asst. Engr., Navy Dept., Bureau of Yards & Docks, Public Works Dept., Naval Operating Base; previously with War Dept., Corps of Engrs., Mil. Constr. Unit; with Gen. Contr. Co., Brooklyn.

Moats, Harold Lee, Anchorage, Alaska. (Age 34) (Claims RCA 5.4) Nov. 1933 to date with U.S. Engr. Dept., in various capacities, since March 1943 as Associate Engr., Reports Sec.

O'Brien, John Melvin, Memphis, Tenn. (Age 35) (Claims RCA 3.2) April 1943 to date Instructor, Memphis Board of Education; previously Archt. Supt. and Structural Engr., Hibbs, Howe & Reese, Archt.-Engr.; Draftsman, Pan American Petroleum Corporation; Draftsman and Designer, J. B. Converse & Co., and A. C. Polk.

O'Brien, William Howard, New Orleans, La. (Age 42) (Claims RCA 3.6 RCM 9.0) Aug. 1934 to date Chf. Engr., Southern Pine Association.

Palm, Alf Raymond (Junior), Sacramento, Calif. (Age 31) (Claims RCA 3.1) July 1936 to date with U.S. Engr. Office as Eng. Aide, Jun. Engr., Asst. Engr. and Associate Engr.

Parsons, Donald Woods, Glen Lyn, Va. (Age 36) (Claims RCA 1.7) May 1936 to date with Appalachian Elec. Power Co., as Draftsman and Instrumentman, Chf. of Party and Surveyor, Engr. and Designer, and (since April 1942) Asst. Superv. Engr.

Patchen, Josef Cooper, Knoxville, Tenn. (Age 30) (Claims RCA 3.0) June 1934 to date with TVA in various capacities, since July 1941 being Office Engr., Cherokee and Douglas Dam construction.

Rowntree, John Burgess, Wellington, New Zealand. (Age 37) (Claims RCA 13.1) Dec. 1928 to date with Public Works Dept. of New Zealand, at present as Engr.

Ryan, William Lawrence, Springfield, Ohio. (Age 38) (Claims RCA 2.1 RCM 1.6) April to Nov. 1942 and April 1943 to date Constr. Engr., Consoer, Townsend & Quinlan; in the interim Constr. Engr., Gannett, Eastman & Fleming, Inc., Md.; previously Asst. Engr., Consoer, Townsend & Quinlan & Battey & Childs; Constr. Inspector, Cook County (Ill.) Highway Dept.

Shea, John Edward, Jacksonville, Fla. (Age 35)(Claims RCA 4.0 RCM 0.6) Feb. 1941 to date with U.S. Army, as Lieut. and (at present) Capt.; previously Soils Engr., U.S. Eng. War Dept.

Smith, Wilson Alexander, Gadsden, Ala. (Age 34) (Claims RCA 7.6) Sept. 1928 to date with Alabama Highway Dept., in various capacities, since Sept. 1942 Res. Engr.

Spencer, Frank Donaldson, Gamboa, C.Z. (Age 34) (Claims RCA 4.5) Feb. 1940 to date with Survey Dept., Dredging Div., The Panama Canal, as Jun. Engr., then (since March 1941) Asst. Engr.; previously with U.S. Engrs.

Steps, William Emil, Topeka, Kans. (Age 36) (Claims RCA 6.2) June 1941 to date Engr. in charge of Watershed Investigations, Div. of Water Resources, State Board of Agriculture; previously Chf. of Party, Wilson Eng. Co.; Highway Designer, Widmer Eng. Co.; with Kansas Highway Comm. in various capacities.

Townsend, Henry McDonald (Junior), Arlington, Va. (Age 31) (Claims RCA 7.3) Nov. 1933 to March 1936 Jun. Topographic Engr., and Nov. 1941 to date Asst. and (at present) Associate Topographic Engr. (Photogrammetric), with U.S. Geological Survey, Washington, D.C.; in the interim Engr. Aide and Jun. Civ. Engr., TVA.

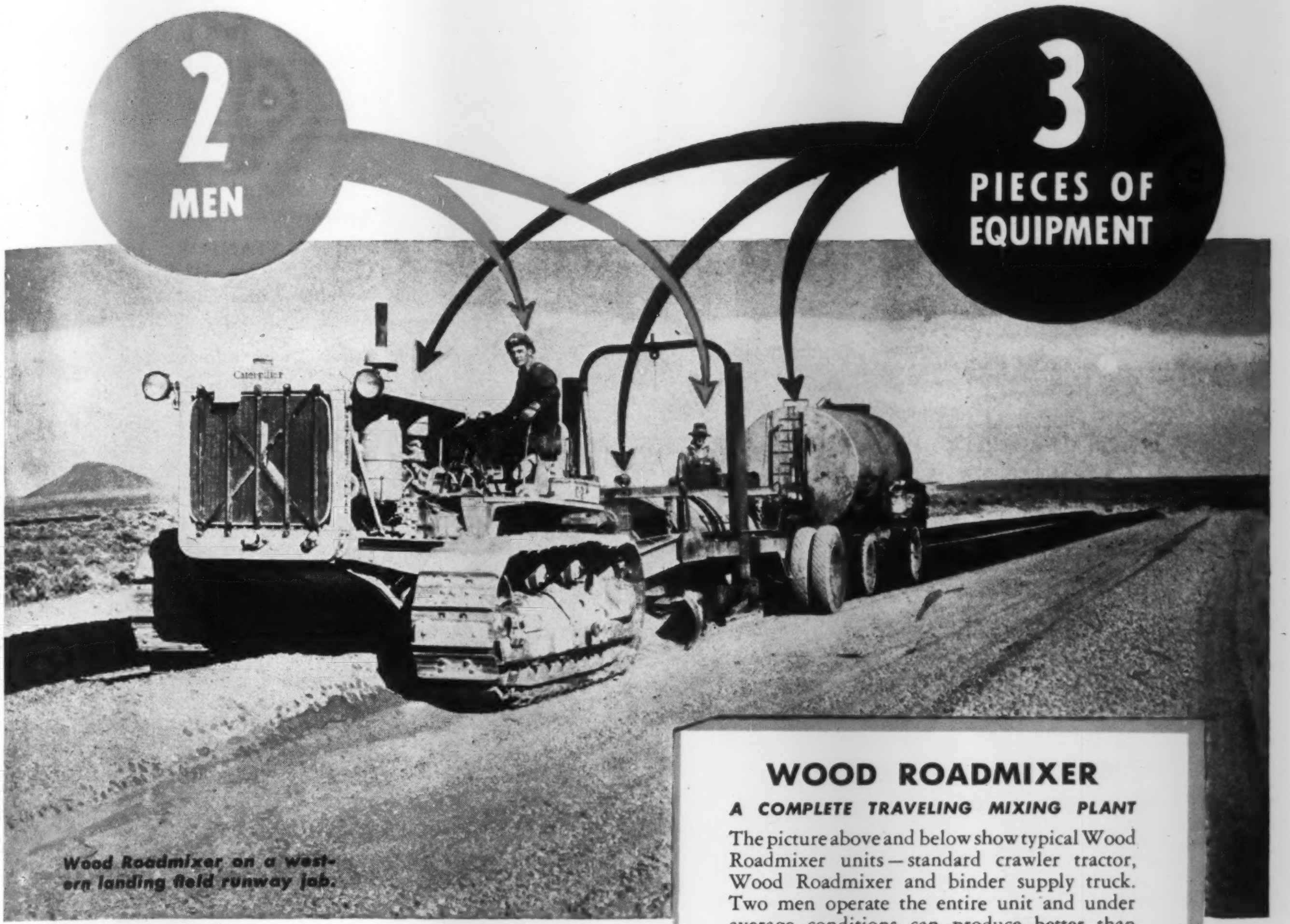
Villamizar, Luis Carlos (Junior), New Orleans, La. (Age 31) (Claims RCA 1.6) Sept. 1940 to date with W. Horace Williams in various capacities, since Nov. 1942 being Asst. to Gen. Supt. on construction of Naval (LTA) Air Station in Houma, La.; previously Engr. with R. P. Farnsworth, Contr.

Wandmacher, Cornelius (Junior), Brooklyn, N.Y. (Age 31) (Claims RCA 1.4) Sept. 1937 to May 1942 Instructor, and May 1942 to date Asst. Prof. of Civ. Eng., Brooklyn Poly. Inst.

Warmenhoven, Peter, North Little Rock, Ark. (Age 52) (Claims RCA 14.8) 1928 to date with Veterans' Administration, since Oct. 1942 as Utility Officer.

Ward, Royal Vincent, San Bernardino, Calif. (Age 55) (Claims RCA 23.2) 1931 to date with San Bernardino County Flood-Control Dist., until 1939 as Flood Control Engr., and (at present) Asst. Engr.

Winkler, Albert Lawson (Junior), New York City. (Age 34) (Claims RCA 3.6) Sept. 1940 to July 1941 1st Lieut., and July 1941 to date Capt., U.S. Army Engrs.; previously with Pennsylvania R.R. as Chainman and Valuation Engr.



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Save man power, save equipment, *and deliver the job on or ahead of schedule.* That's a tough order to fill, but contractors using Wood Road-mix methods of pavement construction are doing it every day. Here's why: Wood Road-mix methods use native or local materials which cut aggregate hauling to a minimum, and save trucks, shovels and the labor necessary to operate them. Wood Road-mix methods use the mix-in-place or traveling plant method of mixing, which eliminates the central plant, additional hauling and labor.

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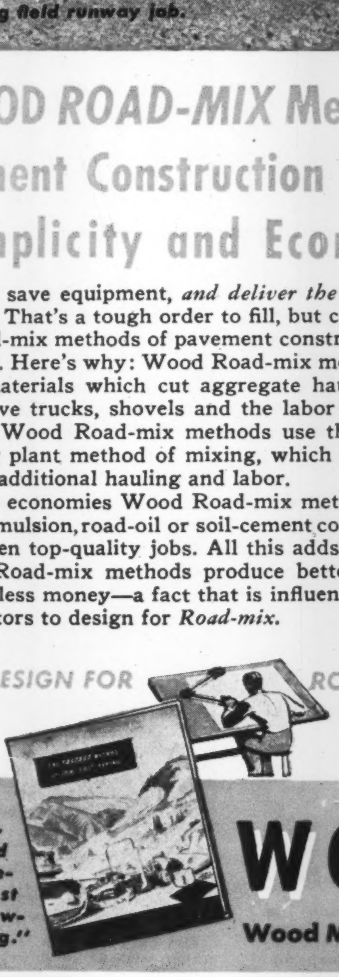
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APPLYING FOR JUNIOR

Alvarez, Luis Edmundo, Ann Arbor, Mich. (Age 25) Feb. 1943 to date graduate student Univ. of Michigan; previously Asst. Engr., Highway Dept. of Chile, Santiago, Chile.

Bostow, Alfred Arthur, Phoenix, Ariz. (Age 25) (Claims RCA 0.7) July 1941 to date Jun. Engr., Leeds, Hill, Barnard & Jewett.

Farwell, Joseph Willard, Jr., Mattapoisett Mass. (Age 26) April 1943 to date Jun. Field Engr., Shreve, Lamb & Harmon-Fay, Spofford & Thorndike; previously with Aberthaw Co. as Cost Engr. and Head Timekeeper; with Seaboard Constr. Co.; Asst. Eng. Aide, U.S. War Dept.; Asst. with Samuel H. Corse.

Rodriguez, Dario, Bethlehem, Pa. (Age 25) Sept. 1942 to date Graduate Student in civil engineering, Lehigh Univ. (Gotshall Scholarship); previously with Chilean Trading Corporation.

Warren, William Joseph, Jr., San Pedro, Calif. (Age 27) Feb. 1943 to date Ensign, U.S. Navy; previously with Phillips Petroleum Co.

VIRTUAL GRADUATE

UNIV. OF ARIZONA
(B.S. in C.E.)

	Age
Crull, Ralph Lee	(22)

(Requirements completed, degree to be conferred in 1944)

1942 GRADUATES

UNIV. OF MINN.
(B.C.E.)

Fosness, John Petrie	(22)
Pitts, Robert John	(25)

1943 GRADUATES

BROOKLYN POLY. INST.
(B.C.E.)

Faller, William Marcus, 3d	(29)
Gorlin, Jacob	(25)

UNIV. OF COLO.
(B.S. in C.E.)

Appel, Walter Michael, Jr.	(22)
Bowen, Emma Frances (Miss)	(21)
Bunger, Howard Phelps, Jr.	(22)
Colwell, Walton Byron, Jr.	(23)
Curtis, George William	(22)
Fauber, Charles Earl	(21)
Ford, Edmund J.	(23)
Hardy, John Morris	(21)
Lake, John Earl	(24)
Light, William Craig	(21)

(B.S. in A.E.)

Fleming, David Edward	(23)
Wagner, Hugo H.	(23)

UNIV. OF CONN.
(B.S. in E.)

Wnek, Mitchell Thomas	(22)

UNIV. OF IDAHO
(B.S. in C.E.)

Fleischman, Volney George	(30)

STATE UNIV. OF IOWA
(B.S. in C.E.)

Mau, Gordon Elliott	(23)

LA. STATE UNIV.
(B.S. in C.E.)

Gasteazoro, Jose Agustin	(25)
St. Germain, Louis Anatole	(21)
Wasson, Roy Aubrey	(21)

MARQUETTE UNIV.
(B.C.E.)

Goelz, Francis Jerome	(23)

UNIV. OF MO.
(B.S. in C.E.)

Rutder, John Cornelius	(22)

UNIV. OF NEBR.
(B.S. in C.E.)

Clark, Warren Allen	(23)

UNIV. OF NEV.
(B.S. in C.E.)

McKenzie, Ernest William	(25)
Pierce, Jack William	(22)

COLL. OF CITY OF N.Y.
(B.C.E.)

Gessow, Alfred	(20)
Rahm, Guenther Gustave	(20)
Steven, James Ross	(24)
Wolfenson, Morton	(21)

ORE. STATE COLL.
(B.S. in C.E.)

Blood, David Livingstone	(22)
Larsen, Lyle Vernon	(22)

RICE INST.
(B.S. in C.E.)

Bartholomew, Charles Kane	(23)
Hueni, Norman Emil	(22)
Krahl, Nat Wetzel	(21)
Mings, Tom Erwin	(22)
Redmann, Gunther Hans Max	(23)
Thompson, Harry Platt	(22)

S.DAK. STATE COLL.
(B.S. in C.E.)

Malmstrom, Edward Carl	(23)

STANFORD UNIV.
(B.A.)

Carpenter, Theodore Marvin	(21)

(B.A. in E.)

Astrue, Charles John	(22)

TEX. TECH. COLL.
(B.S.)

Smith, Wendell Rowe	(24)

UNIV. OF TEX.
(B.S. in C.E.)

Hejl, James Ernest	(20)
Layer, Louis Joseph	(21)
List, George Robert	(21)
Wilkinson, Vernon Ray	(23)

TULANE UNIV.
B.E. in C.E.

Wheelahan, Robert Emmet	(20)

UNIV. OF UTAH
(B.S.)

Richardson, Frederick Lucas	(22)

VA. MIL. INST.
(B.S. in C.E.)

Williams, Francis Brown, Jr.	(20)

WASH. STATE COLL.
(B.S. in C.E.)

Broom, Henry Charles	(26)

UNIV. OF WASH.
(B.S. in C.E.)

Clark, Harry Edgar	(22)
Frodesen, John Martin	(22)
Westling, Marcus	(22)

The Board of Direction will consider the applications in this list not less than thirty days after the date of issue.

Engineering Societies Personnel Service, Inc.

New York	Chicago	Detroit	San Francisco	Boston
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The items listed below have been furnished by the Engineering Societies Personnel Service, Inc., which is under the joint management of the Four Founder Societies. This service is available to members and is operated on a cooperative, non-profit basis. In applying for positions advertised by the Service the applicant agrees, if actually placed in a position through the Service as a result of these advertisements, to pay a placement fee in accordance with the rates as listed by the Service. These rates have been established in order to maintain an efficient non-profit personnel service and are available upon request. This also applies to registrants whose notices are placed in these columns. All replies should be addressed to the key numbers indicated and mailed to the New York Office.

A weekly bulletin of engineering positions open is available to members of the cooperating societies at a subscription of $3 per quarter or $10 per annum, payable in advance.

MEN AVAILABLE

Construction Engineer-Project Manager; Assoc. M. Am. Soc. C.E.; registered professional engineer; 36. Extensive experience on surveys, industrial plant construction, and as contractor's engineer and superintendent; estimating, appraisals, engineering reports. Available about September 1 on completion of present war construction. C-9.

Civil Engineer; Jun. Am. Soc. C.E.; 28; B.C.E., Ohio State University, '37; Tau Beta Pi; licensed engineer; 2 years in bridge design and construction; 2 years as construction superintendent on highway work; 2 years as airplane stress analyst; desires waterfront construction work, position in consulting engineering office, or sales engineering. C-10.

Bridge Engineer; Assoc. M. Am. Soc. C.E.; 39; B.S.C.E. and C.E., University of Illinois; licensed; experienced in design and construction of all types of highway bridges; some railroad experience. Desires permanent connection with organization for postwar planning and designing and after-war designing and construction; prefers Rocky Mountain or Pacific Coast regions. C-11.

POSITIONS AVAILABLE

Engineers. (*a*) Assistant Construction Superintendent familiar with reinforced concrete construction, masonry, and carpentry. Salary, $3,400–$3,900 a year. (*b*) Field Engineer familiar with reinforced concrete construction masonry and carpentry layout work. Salary, $2,340–$2,860 a year. Both should have industrial building experience. Location, New York, N.Y. W-1504.

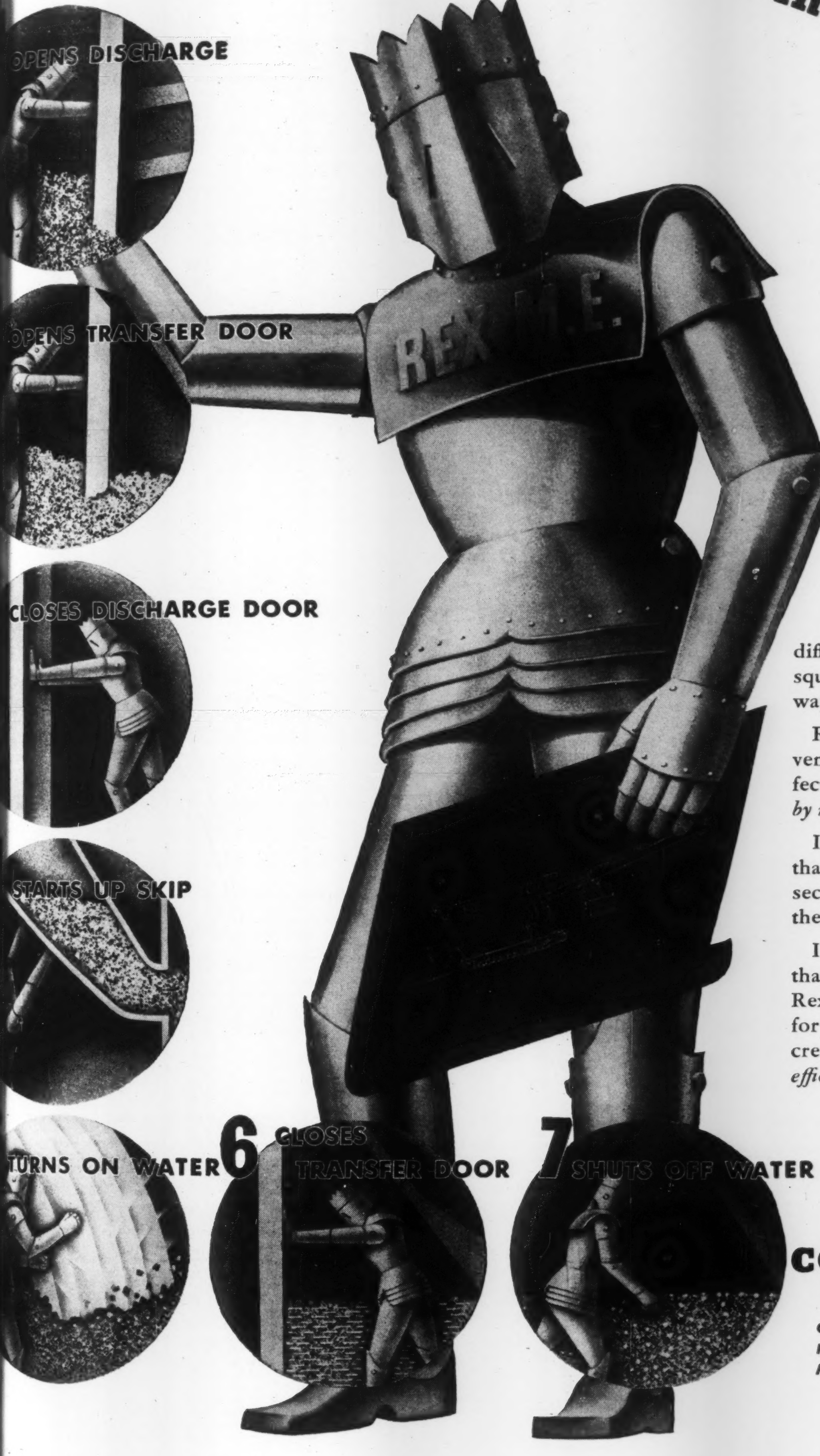
Associate or Assistant Professor of Structural Engineering. Apply by letter giving complete statement of training, experience, and personal data, and including small snapshot. Salary, $2,900–$3,600 for 9 months' work with prospect of summer employment at extra compensation. Location, South. W-1921.

Engineers. (*a*) Stress Analysis Engineer, mechanical, electrical, or civil engineering graduate, to calculate stresses and strength of materials, to do mechanical design calculations for small-gear mechanisms having gears with pitch 32, 48, and 72 and some 96 pitch gears, stress analysis of small castings and fittings for aircraft applications. Salary dependent upon experience—$2,080 a year for recent graduates; $3,600 a year for more experienced men. Location, Ohio. W-1954.

Structural Draftsmen for detailing of prefabricated timber work and structural steel. Permanent. Salary, $3,000 a year for a 40-hour week. Location, New Jersey. W-2190.

Office Engineer, mechanical or civil, preferably with some shipyard experience, to plan

CONDS into CONCRETE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Lost seconds can mean the difference between 5000 and 7700 square yards of smooth airport runways in 24 hours.

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It is one of the many inventions that Rex Mechanical Engineering—Rex M. E.—has provided in machines for mixing concrete, placing concrete and removing water *at maximal efficiency and minimal cost and waste.*

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and expedite work and materials. Will act as assistant to general manager of a shipyard. Salary, \$3,600–\$4,800 a year. Location, East. W-2404.

Structural or Architectural Draftsmen, preferably with industrial building background. Salary, \$3,300–\$3,900 a year for a 40-hour week, plus overtime. Location, Delaware. W-2443 (*a*).

Construction Superintendent who has had considerable experience on small frame construction projects. Must be a thoroughly qualified office man as well as a field supervisor, capable of directing design and making complete estimates. Salary open. Location, New York, N.Y. W-2493.

Engineers. (*a*) Graduate Civil or Mechanical Engineer for design, checking, and layout of industrial equipment, such as continuous filters. Must be draft deferred. Salary, \$1,820 a year for man with no experience; \$2,600 a year for man with two or three years' experience. Permanent. (*b*) Engineer, Civil, Mechanical, or Chemical, young, for sales and service department. Location, New Jersey. W-2496.

Structural Designers who have had some industrial building design. Work may develop into permanent job. Salary, about \$4,000 a year. Location, Connecticut. W-2504.

Engineers. (*a*) Sales Engineer with experience in estimating, design, and sale of fabricated structural steel. (*b*) Estimator and Designer with structural steel fabrication experience. Salary open. Location, Pennsylvania. W-2512.

Civil Engineer, graduate under 35; preferably with some hydraulic experience. Work involves handling small gang of laborers and other employees. A certain amount of design on concrete, steel, and wooden structures is done, and applicant should be able to handle ordinary work in these lines. Should also be familiar with plant where electric power is generated by water wheels and where steam is made for process purposes. Salary, \$3,000–\$4,000 a year. Location, Massachusetts. W-2525.

Junior Civil Engineer to assist in engineering work connected with planning and housing and with some of the operations connected with the inspection and listing of vacant factory properties available for lease or purchase. Salary, \$3,120 a year plus $7^1/_2$% increase. Location, New York State. W-2553.

Construction Men for development of ground-water supply. Will take charge of construction of collecting and distribution systems in which steel pipe will be used instead of cast-iron pipe. Must know how welded joints are made. Should also know how to apply bitumistic primer and enamel to the interior surface of pipes by spinning them and to the exterior surface by a rolling rig and brushes; how to make taps with a Mueller tapping machine; how to manipulate copper pipe and fittings; and how to place concrete anchors behind fittings. Apply by letter giving complete experience record and salary desired. Living expenses should not exceed \$100 a month. Location, South America. W-2558 (*a*).

Sales Manager with building construction experience and knowledge for the prefabricated timber business. Background in structural steel, architecture, contracting, or sales engineering of building equipment or materials desirable. Should preferably have acquaintance with architects, engineers, and contractors in key points of territory to be covered and able to establish a new product in a new territory. Salary, \$3,800–\$5,400 a year. Territories: one for Chicago and one for New York, N.Y. W-2593.

Structural Designer experienced in steel and concrete, particularly industrial or power plant work. Salary, \$4,600 a year. Location, Maryland. W-2602 (*c*)

Engineer, young, to assist resident engineer on engineering and laying-out of jobs and other office engineering work. Should also be able to do some drafting. Two or three years' engineering education will be sufficient. Some experience on sheet metal work or air-conditioning desirable but not essential. Company now 100% on war work. Salary, \$1,800–\$3,000 a year. Permanent. Location, New York, N.Y. W-2616.

Designing Engineer with hydroelectric experience, particularly on dams, spillways, power house, etc. Salary, \$7,000–\$7,500 a year. Location, Puerto Rico. W-2631.

RECENT BOOKS

New books of interest to Civil Engineers donated by the publishers and filed in the Engineering Societies Library, or in the Society's Reading Room, will be found listed here. The notes regarding the books are taken from the books themselves and are edited by members of the staff of the Society or of the Library. Those books which are in the Library may be borrowed by mail by Society members for a small handling charge.

Air Transport Navigation. By P. H. Redpath and James M. Coburn. Pitman Publishing Corporation, New York and Chicago, 1943. 612 pp., illus., diagrs., charts, 9 × 6 in., cloth, \$5.

This pioneer volume includes chapters on Plotting, Conversion, and Bearings; Determination of Groundspeed and Fuel Consumption; Wind; Radius of Action; Flight Planning, Logs, and Scheduling, etc. Material on dead reckoning and radio direction finding has been combined. The book is an excellent background volume for those interested in transportation and navigation.

Analysis of Continuous Frames by Graphical Distribution of Moments. By A. A. Eremin. Apply to author and publisher, A. A. Eremin, 1541—37th St., Sacramento, Calif., 1943. 17 pp., diagrs., charts, tables, lithographic, $11 \times 8^1/_2$ in., paper, \$2.

This pamphlet presents a graphical method for the distribution of moments in continuous beams or rigid frames. The method is claimed to be as exact as algebraic methods and to be much less time-consuming. Numerous illustrative examples are given.

Engineering Drawing, Practice and Theory, 2 ed. By I. N. Carter and H. L. Thompson. International Textbook Co., Scranton, Pa., 1943. 462 pp., illus., diagrs., charts, tables, $11 \times 8^1/_2$ in., fabrikoid, \$3.

Descriptive geometry and practical engineering drawing are combined in this text, presenting theory and practice simultaneously. Duplication of classroom work is thus avoided, enabling the student to save time.

Engineering Problems Illustrating Mathematics. By J. W. Cell. McGraw-Hill Book Co., New York and London, 1943. 172 pp., diagrs., charts, tables, $9^1/_2 \times 6$ in., cloth, \$1.75.

This text contains a collection of problems for students of college algebra, trigonometry, analytical geometry, and differential and integral calculus. Intended for use in junior and senior engineering courses, it aims to give students a better understanding of the uses of mathematics than is obtained from purely formal exercises, by presenting practical problems of technological and industrial application. The work is a project of the Society for the Promotion of Engineering Education

Geodetic Control Surveys, 2 ed. By H. O. Sharp. John Wiley & Sons, New York; Chapman & Hall, London, 1943. 132 pp., illus., diagrs., charts, tables, $11^1/_2 \times 8^1/_2$ in., cloth, \$3.50.

The methods of surveying and the computations required in making precise control surveys and state plane coordinate systems are presented for use by engineers. Fundamental theory and practical applications are given.

Heating, Ventilating, Air Conditioning Guide, 1943, Vol. 21. American Society of Heating and Ventilating Engineers, 51 Madison Ave., New York, 1943. 1160 pp. and Roll of Membership, 90 pp., illus., diagrs., charts, tables, $9^1/_2 \times 6$ in., cloth, \$5.

The 1943 edition of this well-known reference book follows the form of preceding ones but has been carefully revised and, in part, rewritten. A chapter on abbreviations, symbols, and standards has been added, and an appendix discusses emergency war practices now in use.

Laboratory Manual for Chemical and Bacterial Analysis of Water and Sewage, 3 ed. rev. and enl. By F. R. Theroux, E. F. Eldridge, and W. L. Mallmann. McGraw-Hill Book Co., New York and London, 1943. 274 pp., diagrs., charts, tables $8^1/_2 \times 5^1/_2$ in., cloth, \$3.

This manual provides the engineer with procedures for all the usual tests made in water and sewage plant laboratories, as well as with many special tests required for stream surveys and trade-water analysis. A particular feature is the manner of presentation, which permits the student to follow the methods of analysis by definite step-by-step procedures. In this third edition a section dealing with the testing of boiler waters has been added.

New York Plans for the Future. By Cleveland Rogers. Harper and Brothers, New York and London, 1943. 293 pp., illus., $8^1/_2 \times 5^1/_2$ in., cloth, \$3.

City officials and all with a stake in the community should be stimulated by this summary and interpretation of municipal government trends. The author is concerned with the better-ordered city of tomorrow, as he discusses the policies under which the present planning efforts go forward and the problems to be solved.

(The) Physics of Blown Sand and Desert Dunes. by R. A. Bagnold. William Morrow & Co., New York, 1943. 265 pp., illus., diagrs., charts, tables, $9 \times 5^1/_2$ in., cloth, \$5.

The phenomena produced by the action of wind on sand, with which this book is directly concerned, are but one aspect of the wider problem of the transport of solid particles of any kind by fluids in general. Much of the information included is therefore useful in other engineering fields. Part I deals with wind-tunnel experiments on the mechanism of sand transport. Part II covers small-scale surface phenomena such as ripples and the problem of size-grading of grains. Part III explains the growth and movement of dunes in general and the peculiar characteristics of the two main types.

Practical Physics. (Industrial Series.) By M. W. White, K. V. Manning, R. L. Weber, and R. O. Cornett; prepared under the direction of The Division of Arts and Science Extension, Pennsylvania State College, McGraw-Hill Book Co., New York and London, 1943. 365 pp., illus., diagrs., charts, maps, tables $9^1/_2 \times 6$ in., cloth, \$2.50.

This elementary, practical, and abbreviated text in introductory general physics is designed to meet a specific need created by the pressure of wartime conditions. Primary emphasis is placed upon the basic principles of those portions of physics that are of immediate use in war industry, technical work, and the armed services. Simple illustrative experiments are included.

Simplified Design of Reinforced Concrete. By H. Parker. John Wiley & Sons, New York; Chapman & Hall, London, 1943. 249 pp., diagrs., charts, tables, 8 × 5 in., leather, \$2.75.

Beginners whose preparation does not extend beyond a knowledge of the principles of mechanics and of high-school algebra will find this a helpful text. The design of the commonest structural elements is explained simply and concisely, with some discussion of the theory involved. Illustrative problems are solved.

Rehabilitation in Boston, Vol. II. A Progress Report on Reconstruction. The City Planning Board of Boston, May 1943. 54 pp., figs., diagrs., tables, $11 \times 8^1/_2$ in., paper.

This booklet comprises a progress report covering the activities of the Boston City Planning Board for the past year in continuing the rehabilitation studies begun in 1941. The present report covers the preparation of a design for the reconstruction of a 17-acre "sample area" in the South End of Boston. It is believed that the information contained in the present report will enable the city to outline certain broad policies in preparing for postwar exigencies.

The Engineer's Manual of English, Rev. Ed. By W. O. Sypherd, Alvin M. Fountain, and Sharon Brown. Scott, Foresman and Company, Chicago (623 South Wabash Avenue), 1943. 503 pp., 7 × 5 in., cloth, \$2.50.

The main features of the revised edition of this manual include a strengthening of the chapters on correspondence and the writing of reports; the complete revision of Chapter I and of the chapter on writing for technical journals; and the addition of appendixes on military communications and public speaking. The manual is intended to serve as a textbook in English composition for college students in engineering, as well as a reference book on technical usage for practicing engineers.

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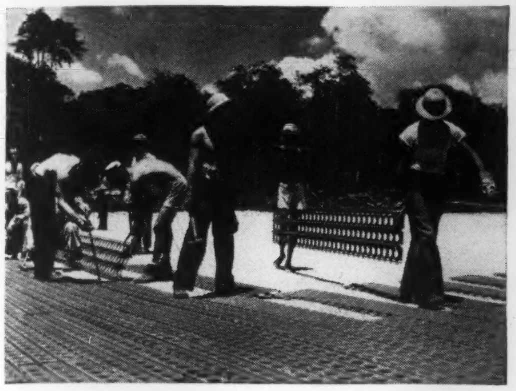
U·S·S Air-Dek has been so successfully used overseas that from one theatre of war it is reported that nine out of thirteen fields now in use employ this steel landing mat in whole or in part.



OFFICIAL U. S. NAVY PHOTOGRAPHS

"TELL us where you want an airdrome," say the Engineers, "and we'll build you a runway for a Flying Fortress in three days." This military miracle, truly a triumph of logistics, has been made possible by U·S·S Air-Dek.

Developed in collaboration with the Corps of Engineers, Air-Dek has proved one of the most important contributions to this war's successful progress. Even on shifting sands, on sticky mud, on treacherous tundra or in steaming tropical jungles, Air-Dek makes it possible to construct a hard-surfaced runway for a fully-loaded bomber or a fast-landing fighter, literally in a matter of hours.

By taking every advantage of its possibilities, our military engineers have used Air-Dek to keep our planes within efficient fighting range of the enemy, when and where he least expected them.*

Today, U·S·S Air-Dek is building the firm runways of our far-ranging striking power. Tomorrow, Air-Dek will provide practical and quickly-built flight strips and other landing facilities for the benefit of our commercial and private flying. Its use will give quick and easy access to regions hitherto inaccessible . . . will make possible the re-exploration and re-settlement of the world.

The "magic carpet" of U·S·S Air-Dek is made up of hundreds of pierced and ribbed steel planks like this. Each covers an area 15 in. wide and 10 ft. long— weighs about 63.5 lbs. These planks — one-piece stampings readily turned out in mass production — have integrally formed interlocking and fastening devices along both edges to permit fast laying of any desired length and width of landing strip.

Air-Dek bundles compactly, requires a minimum of shipping space, transports readily and can be laid at high speed either by day or night. Sections can be easily replaced when damaged. Disassembly for re-use is simple.

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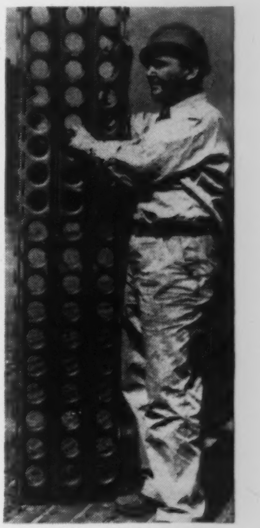
WITH WAR BONDS



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UNITED STATES STEEL

***It was from an Air-Dek runway, secretly constructed on a remote Aleutian island, that our fighters and bombers struck the Japanese invasion fleet headed for Dutch Harbor. Attacked from the rear—and by *land-based* planes—the Japs turned tail in consternation.**

CURRENT PERIODICAL LITERATURE

Abstracts of Articles on Civil Engineering Subjects from Publications (Except Those of the American Society of Civil Engineers) in this Country and Foreign Lands

Selected items for the current Civil Engineering Group of the Engineering Index Service, 29 West 39th Street, New York, N.Y. Every article indexed is on file in The Engineering Societies Library, one of the leading technical libraries of the world. Some 2,000 technical publications from 40 countries in 20 languages are received by the Library and are read, abstracted, and indexed by trained engineers. With the information given in the items which follow, you may obtain the articles from your own file, from your local library, direct from the publisher, or they may be borrowed from The Engineering Societies Library. Photoprints will be supplied by this library at the cost of reproduction, 25 cents per page to members of the Founder Societies (30 cents to all others), plus postage, or technical translations of the complete text may be obtained at cost.

FOUNDATIONS

Pile. Practical Hints on Piling, G. H. Gardner. *Soc. Engrs.—J. & Trans.*, vol. 33, no. 2, July–Dec. 1942, pp. 68–84. Practical notes on piling made for engineer attempting work which entails both manufacture and driving of piles; timber, reinforced concrete, and steel piles; preparation for piling, hammers, and piling operations; sheet piles.

Soils, Erosion. Soil and Water Conservation, A. F. Coventry. *Eng. J.*, vol. 26, no. 4, Apr. 1943, pp. 194–195. Serious aspects of agricultural Ontario with reference to fertile top soil now eroded to average of 6 in.; effects of this condition on postwar agriculture; effects on water supply, game, and forest products.

Soils, Stabilization, Peru. Telford Peruano y Sus Variantes, C. Romero Sotomayor. *IV Congreso Panamericano de Carreteras—Memoria*, vol. 1, 1942, pp. 749–758, supp. plates. Peruvian telford and its variants; due to climatic and geological conditions, particularly in torrential regions of Peru, nearly all subgrades of roads must be consolidated over extended stretches; since 1919, when building of automobile roads was started, special attention has been given to study of consolidation methods; method of building Peruvian telford; modification.

Tunnel Construction, Earth Pressure. Determination of Lateral Passive Soil Pressure and Its Effect on Tunnel Stresses, M. A. Drucker. *Franklin Inst.—J.*, vol. 235, no. 5, May 1943, pp. 499–512. Formulas developed from which pressure and its effect on thrusts, shears, and moments, may be readily obtained for any given set of conditions; method could be used with any procedure employed for determining effects of active forces and their vertical reactions; only result of such calculations, necessary for determining lateral passive pressure, is deflection, at horizontal diameter of tunnel, due to assumed active forces.

HYDRAULIC ENGINEERING

Flow of Water, Pipes. Hydraulics of Culverts, F. T. Mavis. *Penna. State College—Eng. Experiment Station—Bul. No. 56*, 1943, 34 pp., 50 cents. Until further field observations are available, report is submitted as tentative basis of analyzing hydraulic problems of conduits of intermediate length and as bridge to gap which has existed between two hypotheses of flow of water through culverts. Bibliography.

Hydraulic Structures, Painting. Painting Underwater Steel, C. Gliddon and A. J. Chabot. *Eng. J.*, vol. 26, no. 6, June 1943, pp. 341–342. Experience and practice on Gatineau River, Canada, applying mainly to treating and painting of hydraulic turbine headgates; cleaning and painting; tests prove red-lead priming with bituminous top coat most satisfactory treatment.

HYDROELECTRIC POWER PLANTS

Weirs, Submerged. Long Weir Increases Niagara Falls Power. *Eng. News-Rec.*, vol. 130, no. 20, May 20, 1943, pp. 744–746. Production of power for Canadian and American war industries will be increased by 1,500-ft submerged weir constructed to obtain maximum benefit from water diverted around Niagara Falls; 10,000 cu yd of stone was placed by 2,600-ft cableway, with one traveling tower on Canadian shore and other on artificial island several hundred feet from American side.

HYDROLOGY AND METEOROLOGY

Bridges, Earthquake Resistance. Exposicion sobre el sistema soportante mas adecuado para puentes de hormigon armado en terreno sismico, H. Leitner. *Ingenieria* (Mexico), vol. 17, no. 2, Feb. 1943, pp. 37–49. Explanation of most adequate supporting system for reinforced concrete bridges in earthquake regions; movements produced by earthquakes; detailed mathematical study of earthquake effects on types of articulated arches for long spans.

Rain and Rainfall, New England. Rainfall in New England—II, G. V. White. *New England Water Works Assn.—J.*, vol. 57, no. 1, Mar. 1943, pp. 15–62. Tabular data given with reference to rainfall in Maine, New Hampshire, and Vermont.

IRRIGATION

Australia. Berriquin Irrigation Scheme, New South Wales, J. M. Antill. *Civ. Eng.* (London), vol. 38, no. 412, Apr. 1943, pp. 73–75. Particulars of irrigation works which comprise Yarrawonga weir and Mulwala canal (and its branches) covering length of 75 miles; construction work and mechanical control equipment of canal and weir are discussed.

LAND RECLAMATION AND DRAINAGE

Airports. Pre-Cast Box Conduits for Runway drainage, C. R. Otto. *Eng. News-Rec.*, vol. 130, no. 124, June 17, 1943, pp. 899–900. Dish-topped box conduits of interlocking two-piece pre-cast concrete units form new type of runway and apron drainage at two army air fields in West; conduits, their tops slotted to receive runoff, are set flush with top of runway to serve as extension of paving; walls and top of units were thickened to eliminate reinforcing.

MATERIALS TESTING

Beams and Girders, Wood-Concrete. Tests of Composite Timber and Concrete Beams, F. E. Richart and C. B. Williams, Jr. *Ill. Univ.–Eng. Experiment Station—Bul. No. 343*, May 11, 1943, 62 pp. Fabrication and testing of beams; results and analyses of results; from tests, allowable values for various types of shear connections have been determined and are believed to be suitable for safe, conservative design of composite beams and slabs. Bibliography.

Cement Admixtures. Powdered Aluminum as Admixture to Concrete, R. W. Carlson. *Am. Soc. Testing Matls.—Proc.*, vol. 42, 1942, pp. 808–818, (discussion) 819–820. Concretes containing small amounts of aluminum powder, exhibit increased resistance to freezing and thawing in calcium chloride, improved bond strength to steel, and greater flexural strength; compressive strength is decreased for most plastic concretes but may be increased for harsh mixes and for any concrete confined so as to restrain attempted slight expansion.

Concrete. Factors Influencing Reflectivity of White Portland Cement Concretes, C. W Muhlenbruch and E. H. Miller. *Am. Soc. Testing Matls.—Proc.*, vol. 42, 1942, pp. 775–785, (discussion) 786. Reflectivity of white cement concretes now in wide use for curbs and other reflecting surfaces is affected by types of aggregates, water cement ratio, method of curing, and method of finishing; freezing and thawing, and exposure tests of 150 summer and 100 winter days show that loss of reflectivity may be as high as 70%; various ratios of light and dark sand to cement give information useful in designing mix.

Engineering. New Pathways in Engineering, A. V. de Forest. *Metal Progress*, vol. 43, no. 5, May 1943, pp. 719–723, 750. Broad discussion of fundamentals of engineering design; examples of problems in bridge design; new strain gages for measuring loads; strength of materials; tools for stress analyst; discovery of local defects. Bibliography. Brief version of talk before Philadelphia Chapter Am. Soc. Metals.

Road Materials, Bituminous. Method for Testing and Evaluation of Road Tars, E. O. Rhodes and H. E. Gillander. *Am. Soc. Testing Matls.—Preprint No. 85*, for meeting June 28–July 2, 1943, 11 pp. Test method developed for evaluating weathering properties of road tars that, in case of series of tars, gave results agreeing with their service behavior; air at 30 C is passed through tar-sand mix having tar films in order of 0.006 mm thick, and extensive weathering is brought about in 23 hours; test results must be interpreted on basis of knowledge of road design. Bibliography.

PORTS AND MARITIME STRUCTURES

Piers, Construction. Long Wharf Constructed in Five Months. *Eng. News-Rec.*, vol. 130, no. 24, June 17, 1943, pp. 896–898. Extensive new pier facilities, including 81-ft-wide wharf, 2,350 ft long, and 9 miles of railroad track, have recently been completed at one of our ocean ports; four floating rigs drove 7,000 wood piles required for wharf, and 100-man carpenter crew followed immediately to add 120 ft of wood deck in 210-hour shifts.

Seawalls, Construction. Construction of Sea Defense Works, C. E. Fellows. *Civ. Eng.* (London), vol. 38, no. 441, Mar. 1943, pp. 55–59. Notes presented are designed to serve as guide to construction of various types of sea defense works; discussion of plant materials, site preparation and setting out, test piles, damming, excavation, concreting, and finishing.

Shore Protection. Beach Protection—Erosion, Pollution Mar Shores, A. G. Johnson. *Western Construction News*, vol. 18, no. 6, June 1943, pp. 259–262, 279. Recreational areas can be ruined by oil and sewage pollution, and breakwaters and other man-made devices can destroy shore values by interrupting natural course of sand movement along littoral.

Wood Preservation. Timber "Copperplated" to Frustrate Worms, H. W. Young. *Compressed Air Mag.*, vol. 48, no. 6, June 1943, pp. 7060–7062. Description of process patented in 1925 by H. S. Andrews, president of wood preserving company of Olympia, Wash., and improved since that date; commercial plant is now engaged principally in treatment of wood piling for U.S. Navy; all treated piles contain not less than 3 oz metallic copper per cu ft.

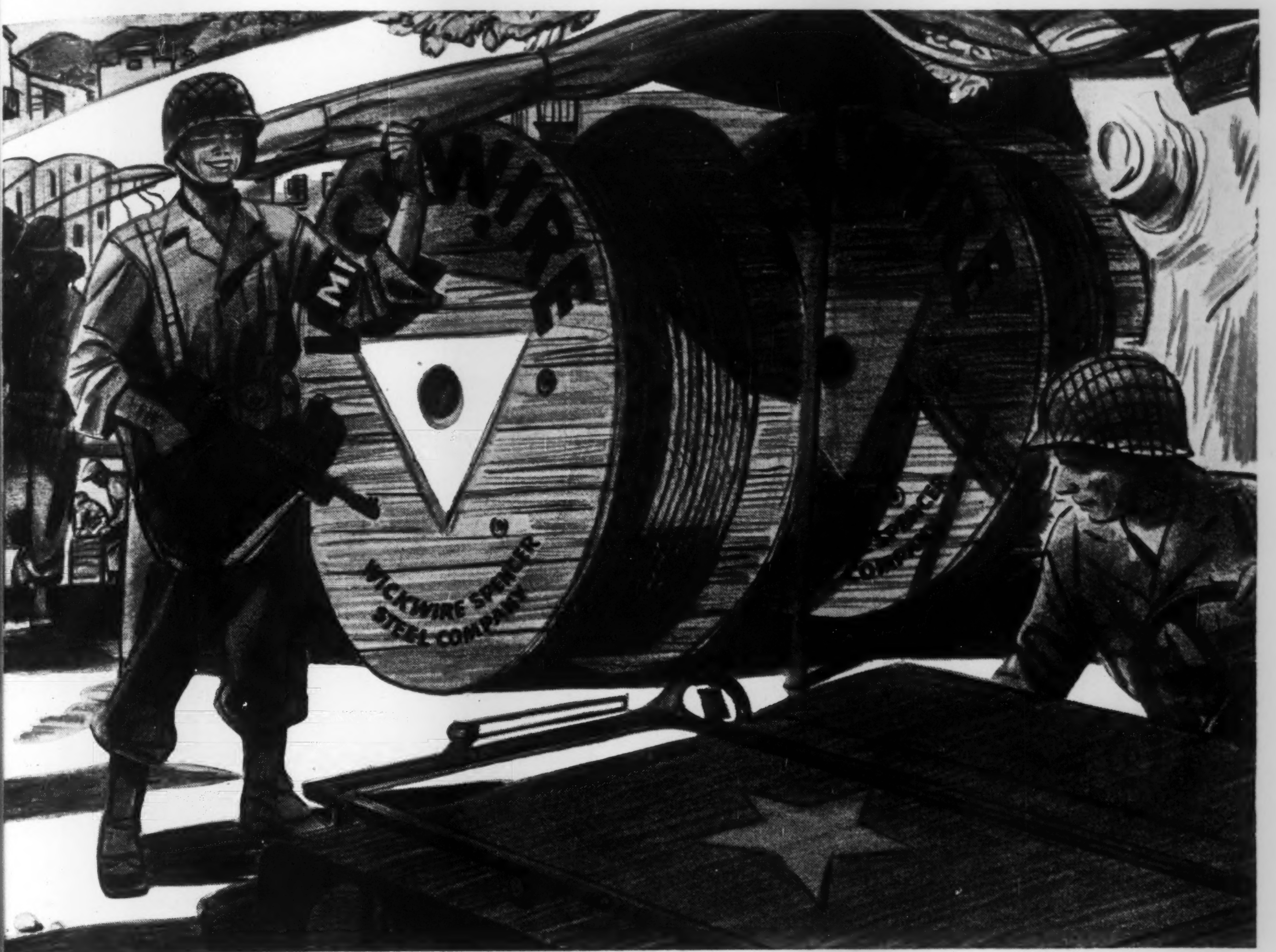
ROADS AND STREETS

Airport Runways. Drainage, Runways and Roadways at Aerodromes in No. 1 Training Command, Royal Canadian Air Force, G. G. Reid. *Roads & Bridges*, vol. 81, no. 5, May 1943, pp. 29–33, 74–78, 80. Construction procedure described; drainage system is combination of French underdrains with catchbasins for overflow; storm sewers are of typical unreinforced concrete; runway and roadway construction is described and cross sections are shown.

Experimental. Waller-Denison Track. *Surveyor*, vol. 102, no. 2678, May 21, 1943, pp. 213–214. Report on experiment in road-surface construction; layer of broken stone was first rolled into turf, then layer of cement grout about $^1/_4$ in. thick was spread; on this grout, while still wet, coir reinforcing mat was laid transversely, and on this, concrete mix $^3/_4$ to 1 in. thick was spread; road has been tested for 3-month period and, although this is not conclusive evidence, roads seems to show satisfactory wearing qualities. Before Instn. Highway Engrs.

Flight Strips. Auxiliary Flight Strip Plan, F. E. Schnepfe. *Western Construction News*, vol. 18, no. 4, Apr. 1943, pp. 166–170. Military and civil value shown for emergency landing strips to be built near highways; site selection, base preparation, and paving are important factors in design of these unattended fields which have none of facilities of airports.

Highway Systems, Alaska. Alaska Highway—New Transport Route Opens Up Important Canadian Territory. *Transport World*, vol. 93, no. 2981, Apr. 8, 1943, pp. 141–143. Notes on 1,500-mile Canada-Alaska highway; military considerations; constructing roadway. See also similar descriptions indexed in *Engineering Index*, 1942, p. 519, from various sources.



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Highway Systems, Alaska. Alcan—America's Glory Road., H. W. Richardson. *Eng. News-Rec.*, vol. 130, no. 2, Jan. 12, 1943, pp. 63–70. Part III—Construction tactics; Army procedure; bulldozing trees; contractors' organizations, and equipment; bridges; drainage. Conclusion of series, indexed in *Engineering Index*, 1942, p. 519.

Highway Systems, Alaska. Our New Northwest Passage, G. Constable. *Military Engr.*, vol. 35, no. 211, May 1943, pp. 221–226. Geographical note on country traversed by new highway built to serve Alaskan output.

Highway Systems, California. San Diego Builds Harbor Drive Years Ahead of Schedule Because of War. *Western City*, vol. 19, no. 5, May 1943, pp. 16–20. Details of construction of broad, landscaped highway skirting San Diego Bay from Point Loma south to National City; project is divided into two parts totaling 8.4 miles in length; drive has four lanes and dividing strip; constructed to modern standards; note on 16-in. high pressure water line; most of Harbor Drive is built on filled land; map showing route of drive given.

Highway Systems, Pan-American. Pan-American Road Rushed, H. E. Spickard. *Western Construction News*, vol. 18, no. 4, 1943, Apr., pp. 153–155. Progress in completion of segment under construction in Central America.

Highway Systems, Pan-American. Pioneer Road to Panama, S. A. McMillion. *Military Engr.*, vol. 35, no. 212, June 1943, pp. 278–282. Illustrated description of materials and labor involved in construction of Pan-American Highway between Mexico–Guatemala border and Panama City.

Highway Systems, Pennsylvania. Work continues on Pittsburgh Expressway. *Eng. News-Rec.*, (News Issue), vol. 131, no. 2, July 8, 1943, pp. 4–5. Progress on McKnight Road being built on 80-ft right of way consisting of two 24-ft roadways of 2-in. crown, 13-ft shoulder, and 6-ft center island.

Highway Systems, Postwar. Postwar Development of Highways, J. A. Gough. *Roads & Road Construction*, vol. 21, no. 245, May 1943, pp. 125–128. Sectional interests must be subordinated to general good; present highway system is inadequate; motorways; traffic-lane widths and road bridges; provision for future widenings; direction signs; planning must be undertaken by National Planning Authority. Presidential address before Instn. Highway Engrs.

Highway Systems, United States. Public Road Work in United States, 1942. *Engineer*, vol. 175, no. 4557, May 14, 1943, pp. 393–395. According to annual report of U.S. Public Roads Administration, 10,178 miles of road completed during year were composed in large part of improvements at points of serious deficiencies on important main lines of road; at end of year administration had built more than 600 spurs or branch roads giving direct access to war-manufacturing plants and military and naval establishments.

Joints. Rapid Sealing of Pavement Joints, I. H. Crutcher, Jr. *Better Roads*, vol. 13, no. 4, Apr. 1943, p. 179. Method of sealing expansion and contraction joints in concrete pavements employed by Texas Highway Department has been found considerably faster and cheaper than customary method of pouring joints with additional asphalt, and it also saves asphalt; new method melts filler in and adjacent to joint and trims off excess.

Maintenance and Repair. Report on Highway Maintenance Equipment and Rental Procedure, T. H. Dennis. *Calif. Highways & Pub. Works*, vol. 20, no. 12, Dec. 1942, pp. 10–15, and vol. 21, nos. 5, 6, May–June 1943, pp. 20–27. Study made of various types of equipment available or in use in performing highway maintenance work with view to recommending most suitable and practicable equipment for specific maintenance operations and establishment of uniform equipment rental procedure throughout United States. Condensed report of Subcommittee on Highway Maintenance Equipment appointed by Highway Research Board in 1940.

Maintenance and Repair. Street Repair Expenditures Justified by Weighted Estimates. *Eng. News-Rec.*, vol. 130, no. 22, June 3, 1943, pp. 821–822. Simple printed forms for reports on condition of street paving adopted by city of Los Angeles; method of record keeping is said to provide scientific basis for expending available funds where they will do the greatest good.

Maintenance and Repair. Tests on Special Type of Double Surface Treatment, A. T. Goldbeck. *Crushed Stone J.*, vol. 18, no. 1, Mar. 1943, pp. 15–17. It is important that road maintenance be continued even though new road construction must be stopped temporarily; research has indicated excellent results with method of double surface treating concrete roads, as described.

Maintenance and Repair. Winter Road Maintenance, T. G. Morgan. *Eng. & Contract. Rec.*, vol. 56, no. 20, May 18, 1943, pp. 18–21. Two plans of winter road maintenance in force in Province of Quebec; combating storm; value of winter roads; what roads to maintain; problems of winter road maintenance; snowfall in Montreal district averages 100 in. per year; snow removal costs; importance of highway maintenance.

Postwar. Postwar Planning and Reconstruction, R. A. B. Smith. *Roads & Road Construction*, vol. 21, no. 244, Apr. 1, 1943, pp. 106–108. Control over purely local matter should not be disturbed; ownership of land; communications; roads; re-development of built-up areas; private enterprise; standards for highways; master plan wanted. Excerpts from Report on Postwar Planning and Reconstruction issued by Instn. Mun. & County Engrs.

Road Machinery. Desert Snowplow Cuts Brush, L. L. Lee. *Western Construction News*, vol. 18, no. 5, May 1943, pp. 209–210. Cutting plow was built of salvaged material for purpose of clearing overgrown bottom of Salt River Valley in Arizona, when bulldozer proved ineffective and hand work was too costly.

Road Machinery, Pavers. Three Dual-Drum Pavers Lay 1,300,000 Sq Yd of Airfield Pavement in 105 Working Days. *Construction Methods*, vol. 25, no. 3, Mar. 1943, pp. 57–59, 130–132, 134–136. Details of equipment and methods used in placing non-reinforced slab of various uniform thicknesses from 9 in. to 5 in. for runways, taxiways, aprons, and landing mats on natural clay subgrade in 22-ft lanes, accommodating standard width equipment.

Stabilization. How to Design Stabilized Soil Mixtures, R. G. Hennes. *Eng. News-Rec.*, vol. 130, no. 20, May 20, 1943, pp. 761–762. Description of method used by author, which takes into account both plasticity and grading to greater extent than do ordinary empirical rules or charts.

Stabilization. Use of Graded Stone in Runway and Road Construction, C. H. Haswell. *Roy. Engrs., J.*, vol. 57, June 1943, pp. 97–103. Due to heavy British consumption of cement for defense works, it was found necessary to apply local soil materials to runway and road projects; soil analysis and determined stabilization formulas at two sites are described.

Transportation, Brazil. Brazilian Transportation, R. F. Zander. *Am. Engr.*, vol. 13, nos. 4, 5, June 1943, pp. 6–8; July, pp. 13–16, and 25. Brief story of its development with some reflections on engineering and economics as applied to American transport systems.

SEWERAGE AND SEWAGE DISPOSAL

Activated Sludge. Economics of Cleaning Air-Diffusion Media, J. J. Wirts. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 205–208. Problem of maintaining porosity of air-diffusion plates and tubes used principally in conjunction with activated sludge process and grease flotation and flocculation has been of growing concern to plant managers; new scrubbing principle is described.

Camps, Military. Sewage Treatment at Air-Training Schools in Western Canada, R. A. McLellan. *Water & Sewage*, vol. 81, no. 5, May 1943, pp. 13–19, 36–38. Review of what has been accomplished during past 3 years, in matter of sewage treatment, to serve various schools and stations operated under British Commonwealth Air Training Plan.

Cranston, R.I. Cranston, Rhode Island, Builds Complete New Sewerage Works for 53,000 People, R. W. Horne. *Boston, Soc. Civ. Engrs.—J.*, vol. 30, no. 2, Apr. 1943, pp. 66–121. Comprehensive survey of works recently completed at cost of $6,000,000; average daily sewage flow is 2.4 mgd; constructional details of sewers, pumping plants, and treatment plants.

Grease Removal. Rendering of Sewage Grease at Civilian and Army Plants, C. P. Gunson. *Sewage Works Eng. & Mun. Sanitation*, vol. 14, no. 7, July 1943, pp. 329–330. Author contends that attitude of public has been definitely toward grease removal as disposal rather than utilization problem; position of sewage grease in competitive tallow market.

Industrial Wastes. Wartime Disposal of Waste Pickle Liquors, W. G. Imhoff. *Wire & Wire Products*, vol. 18, no. 7, July 1943, pp. 389–392. Basin method for treating waste pickle liquors described, which has been in use satisfactorily in small plant for past 20 years; method has been called basin system of treating waste pickle liquors, because process and equipment is one of series of passing liquors on from one basin to another, treating chemically, and finally emptying clear, tasteless, acidless, harmless water, back into river.

Load Variation. Hourly Load Variations in Relation to Sewage Treatment Plant Operation, E. T. Killam. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 235–236. Study on load variations made in effort to direct design and operation of sewage plants.

Manholes, Covers. Wartime Substitute Manhole Covers and Frames, G. E. Symons. *Water Works & Sewerage*, vol. 90, no. 5, May 1943, pp. 179–181. Notes on use of wood, concrete, and terra cotta for manhole covers and frames.

Odor Control. Control of Odorous and Destructive Gases in Sewers and Treatment Plants, C. C. Hommon. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 207–209. Deleterious physical effects of hydrogen sulfide gas are described; use of chlorine with attention paid to feeding point numbers.

Sewage Pumping Plants. Sewage and Sludge Pumping, H. Ryon. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 223–226. Part I: Sewage pumping: pneumatic ejector; pump impellers; submerged vertical pumps; float controls; suction wells; hydraulics. Part II: Sludge pumping, pumps, transmission, packing; valves; knocking problems.

Sewers, Concrete. Pre-Cast Concrete Pipe Used in New Montreal Sewer. *Eng. & Contract Rec.*, vol. 56, no. 22, June 2, 1943, pp. 8–9. Methods used by City of Montreal in construction of tributary sewers; sewers consist of circular, precast reinforced concrete sections; difficult problems overcome in placing large diameter pipe in tunnel sections.

Sewers, Construction. Sewer Constructed as Siphon, A. M. Rawn. *Western Construction News*, vol. 18, no. 3, Mar. 1943, pp. 119–120. Los Angeles County Sanitation Districts built tile-lined concrete sewer to augment inadequate trunk across pressure section in Nigger Slough vicinity.

Sewers, Maintenance and Repair. Some Sewerage Operating Kinks, A. M. Rawn. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 183–184. Hoe designed to scrape debris from sewer as it moves from manhole to manhole propelled by sewage backing up behind it; root cutters.

Sludge Digestion. Activated Sludge Bulking, L. H. Enslow. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 239–242. Some considerations as to causes and corrective measures. Before Ohio Conference on Sewage Treatment.

Sludge Digestion. Theory and Practice of Sewage Sludge Digestion Tank Heating, N. C. Wittwer. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 229–239. Fundamental theory and illustrative problems given for major considerations as follows: Heat losses from sludge digestion tank; heat required to raise temperature of additions of fresh sludge to temperature of digesting sludge; consideration of methods for applying heat; heat transmission; selection of heating equipment.

Disposal Plants, Waste Utilization. Wealth from Waste, F. C. Temple. *Instn. Mun. & County Engrs.—J.*, vol. 69, no. 12, May 25, 1943, pp. 405–410, (discussion) 411–413. Author suggests composting of sewage sludges after drying with view to producing cheap fertilizer of humus type; need for long maturing period cited as chief drawback to scheme.

Waste Utilization. Fertilizer and Fertility, W. Rudolfs. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 261–263. Major and minor constituents of sludge as fertilizer—some applications and favorable results cited.

Water Pollution, California. Sanitary Survey of Sewage Pollution of Santa Monica Bay, E. Belt. *Western City*, vol. 19, no. 6, June 1943, pp. 17–22. Sewage disposal works; field investigations; spread of sewage debris; action of winds; laboratory work; cultures show seasonal changes; degree of surf pollution; epidemiology.

STREET CLEANING AND REFUSE DISPOSAL

Refuse Disposal. City Struggles with Garbage Disposal. *Eng. News-Rec.*, vol. 130, no. 20, May 20, 1943, pp. 756–758. At Oakland, Calif., endeavor has been made to satisfactorily operate disposal plant designed to burn garbage in kiln after salvage by hand sorting from belt; present program includes disposal of wet garbage to hogs and dry garbage to fill.

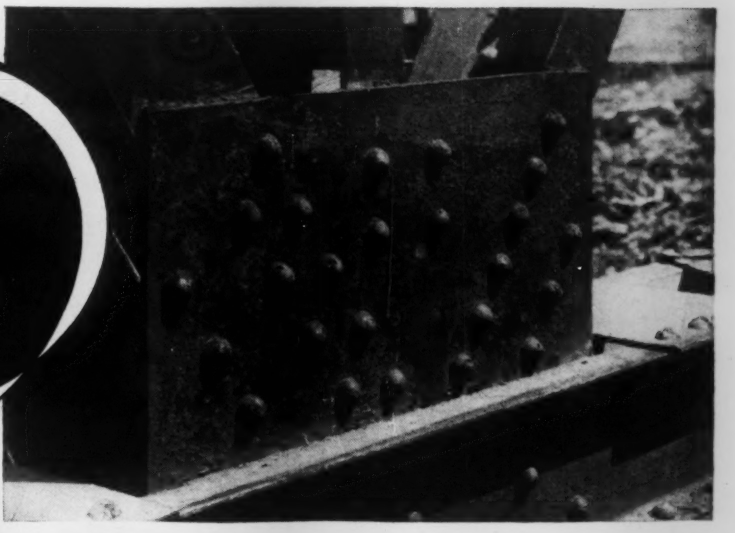
STRUCTURAL ENGINEERING

Arches. Arch and Other Theories as Applied to Portal Frames, S. A. Loveland. *Structural Engr.*, vol. 21, nos. 3, 5, March 1943, pp. 83–114, May, pp. 183–200. Discussion ranges from simple encastre beam to complete closed ring, either rectangular or circular, without internal members, with different kinds of intermediate forms of frames, such as ell frames, portals, mansards, and arches.

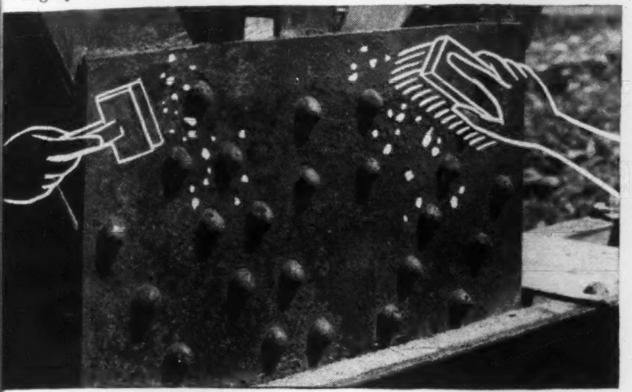
Chimneys, Design. Modern Industrial Chimneys, E. H. MacDermott. *Constructor*, vol. 25, no. 5, May 1943, pp. 30–32. Consideration of factors entering into design of industrial chimneys; size is based on boiler demands; temperature stresses affect thickness of masonry; notes on insulation, acid proofing, and lightning protection.

Framed Structures, Design. Sloping Chords Open Panel Frames by Moment Distribution

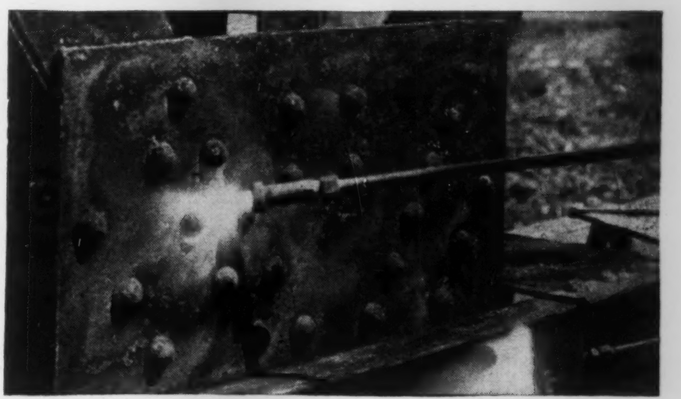
How to renew rusty bridge surfaces by oxyacetylene flame cleaning



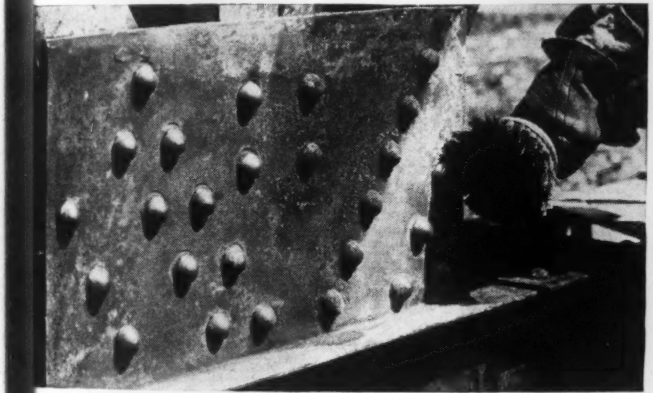
1 Right: Paint-lift, rust and scale have scarred this steel bridge surface. To assure good repainting, the surface must be thoroughly cleaned down to the bare metal.



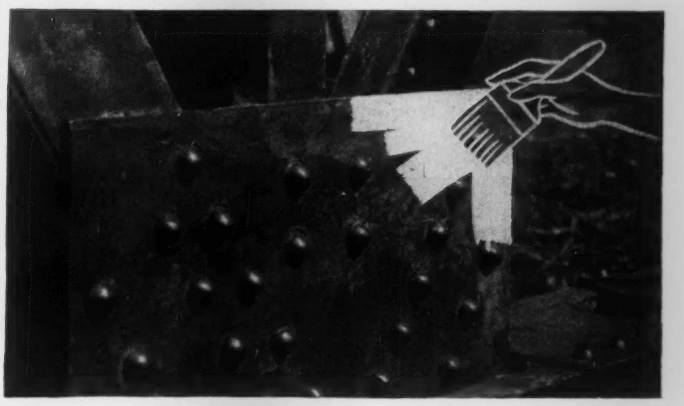
2 The first step in restoring the surface is to scrape off the very loose paint and loose, heavy rust scale; then brush down the surface lightly.



3 Next, an application of the oxyacetylene flame cockles the old paint, loosens imbedded rust and scale, and drives out moisture.



4 Power brushing with a wire brush cleans off the semi-tight scaly material which the oxyacetylene flame has loosened.



5 Here's the renewed bridge surface, ready for repainting. The clean, dry surface assures a lasting paint job and long protection against rust.

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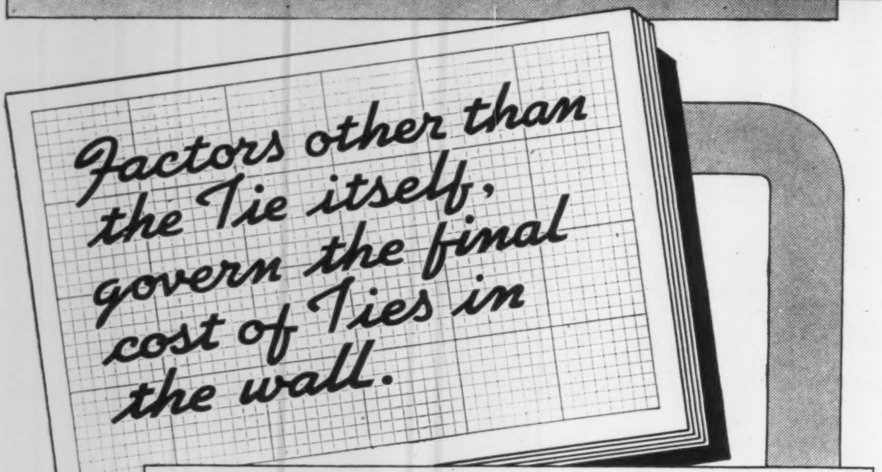
FORM-TY ENGINEERING FACTS


Factors other than the Tie itself, govern the final cost of Ties in the wall.

COMPARISON DATA

SYSTEM	TIE	Safe Load	Tie Length	Weight per Unit			Cost per Unit		
				Tie Only	Working Parts	Total	Tie Only	Working Parts	Total
Prefabricated	½" Tyscrus	6000#	10"	.34#	2.94#*	3.28#	$.08	$ .31	$ .39
	A.C.Form-Tys	3000#	29¼"	.38#	1.73#¶	2.11#	$.05	$ .18	$ .23
	Snap-Tys	3000#	29¼"	.38#§	1.44#	1.82#	$.05	$ .14	$ .19
Field-Assembled	Band Iron	1500#	36"	.39#	.86#†	1.25#	$.03	$ .20	$ .23
	½" Rod & Clamps	5000#	36"	2.0#	3.62#†	5.62#	$.08	$ .60	$ .68
	⅜" Tilt Lock	5000#	10"	.32#	8.5#†	8.22#	$0.325	$1.45	$1.4825

§ Includes built in spreader unit.
¶ Includes Spreader Plates for Form Spreading.
† No provision for spreading forms.
* Includes Tycones for Form Spreading (Opt.)

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TIME AND LABOR SAVING CONSTRUCTION DEVICES FOR CONCRETE CONSTRUCTION

Method, F. N. Weaver. *Boston Soc. Civ. Engrs.—J.*, vol. 30, no. 2, Apr. 1943, pp. 51–65. There is no easy and rapid method of solving complicated frames; in problem under discussion complication arises from inclined chords, which cause, on the one hand, solution of large number of simultaneous equations, and on the other, labor of solving by successive corrections; method here presented has advantage of allowing designer to use familiar methods, which should result in saving in time.

MILITARY ENGINEERING, REVETMENTS. New Bamboo Revetment Construction, C. L. Horn and A. Arroyo. *Military Engr.*, vol. 35, no. 212, June 1943, pp. 284–286. Satisfactory revetment construction described; living bamboo planted to form curved palisade to be backed against convex side with earth.

RETAINING WALLS, EARTH PRESSURE. Lateral Pressure of Sand, A. A. Fordham. *Engineering*, vol. 155, no. 4033, Apr. 30, 1943, pp. 341 (illustrations) and 350. Supplementing author's earlier experiments, report is given on further and more extensive experiments carried out, using specially designed test wall erected in sand pit in vicinity of Swansea, and measurements have been obtained of lateral pressures due to heads up to $7^1/_2$ ft above center of gage; results given.

ROOF TRUSSES. Bowstring Trusses Provide Sawtooth Roof. *Eng. News-Rec.*, vol. 130, no. 24, June 17, 1943, pp. 884–885. To enlarge existing steel frame manufacturing plant with sawtooth roof, bowstring timber trusses of 44-ft span were employed; little more timber was required than for conventional bowstring trusses of equal span used on same job; trusses were fabricated at commercial plant and delivered to job ready for erection.

ROOFS CONCRETE. Building 82-Acre Concrete Roof with Traveling Retractable Forms. *Eng. News-Rec.*, vol. 130, no. 24, June 17, 1943, pp. 874–877. Ribs protruding below barrel-arch concrete roof required ingenious form planning to permit use of traveling carriage; forms were dropped $4^1/_2$ ft to pass under ribs, then rolled ahead on timber frames supported on artillery wheels; chain hoists were used to raise roof form to its new position; over 100,000 cu yd of concrete poured for 82-acre roof in 6 months during fall and winter.

STRUCTURES, BOMBING EFFECTS. Effects of Bombings on Structures and Other Installations, W. C. Voss. *New England Water Works Assn.—J.*, vol. 57, no. 2, June 1943, pp. 127–136. Empirical information on distance from position of exploded or unexploded bomb that one might expect damage to subsurface services, particularly as regards structures having to do with water supply or sewage disposal.

SURVEYING

HIGHWAY SYSTEMS. Three-Stage Surveying Technique for Postwar Road Planning, W. J. Fulton. *Eng. & Contract. Rec.*, vol. 56, no. 20, May 18, 1943, pp. 16–17. Surveying technique required in planning highways shown by consideration of proposed plans of Ontario Department of Highways; first step is traffic survey; second is scale map of area (400 ft to 1 in.) made from aerial photographs; final step is job of design engineer who determines if proposed line fulfills requirements stipulated. Before Assn. Ontario Land Surveyors.

TUNNELS

CONSTRUCTION. Horizontal Radial Well Dewaters Ground for Driving of Shield Tunnels. *Construction Methods*, vol. 25, no. 4, Apr. 1943, pp. 64–65, 106, 108, 110, 112, 114, 116. Ranney radial collector well was applied to dewater sandy soil just ahead of construction shafts at Brooklyn end of Brooklyn-Battery vehicular tunnel to permit advancing twin-shield-driven, cast-iron-lined tubes of this project for considerable distance without recourse to compressed air; illustrations and drawings of equipment shown.

LINING. Notes on Design of Tunnel Linings, R. Hammond. *Civ. Eng.* (London), vol. 28, no. 440, Feb. 1943, pp. 38, 40, 42, 44. Analysis of pressure conditions obtaining in tunnel lining extracts from researches and observations of Hennes, Terzaghi, Eremin, and Brodie dealing with stresses, designs, and methods of placing concrete linings in sewers and tunnels. Bibliography.

MILITARY ENGINEERING. Canada's Tunnelling Companies, C. B. North. *Can. Min. & Met.—Bul.*, no. 374, June 1943, pp. 269–274. Notes on organization of W. T. M. A. (Wartime Mining Association) in Canada; formation of No. 1 Canadian Special Tunnelling Company and No. 2 Canadian Tunnelling Company; outline of conditions at Rock of Gibraltar; activities of No. 1 and No. 2 Canadian Tunnelling Company at Gibraltar.

RAILROAD, MAINTENANCE AND REPAIR. D. & H. Lowers Rock Floor 2 Ft in 2240-ft Tunnel. *Ry. Eng. & Maintenance*, vol. 39, no. 6, June 1943, pp. 440–443. Description of methods employed, under traffic, including ingenious system of progressive runoffs, to provide increased overhead clearance.

RAILROAD, VIRGINIA. C. & O. Replaces 1850 Blue Ridge Tunnel. *Eng. News-Rec.*, vol. 131, no. 1, July 1, 1943, pp. 18–20. Need for larger tunnel to permit passage of more powerful engines and large loads prompted construction of 4,000-ft tunnel through Blue Ridge Mountains on C. & O. Ry.; it will replace tunnel, largely unlined, started in 1850 and in service for 84 years.

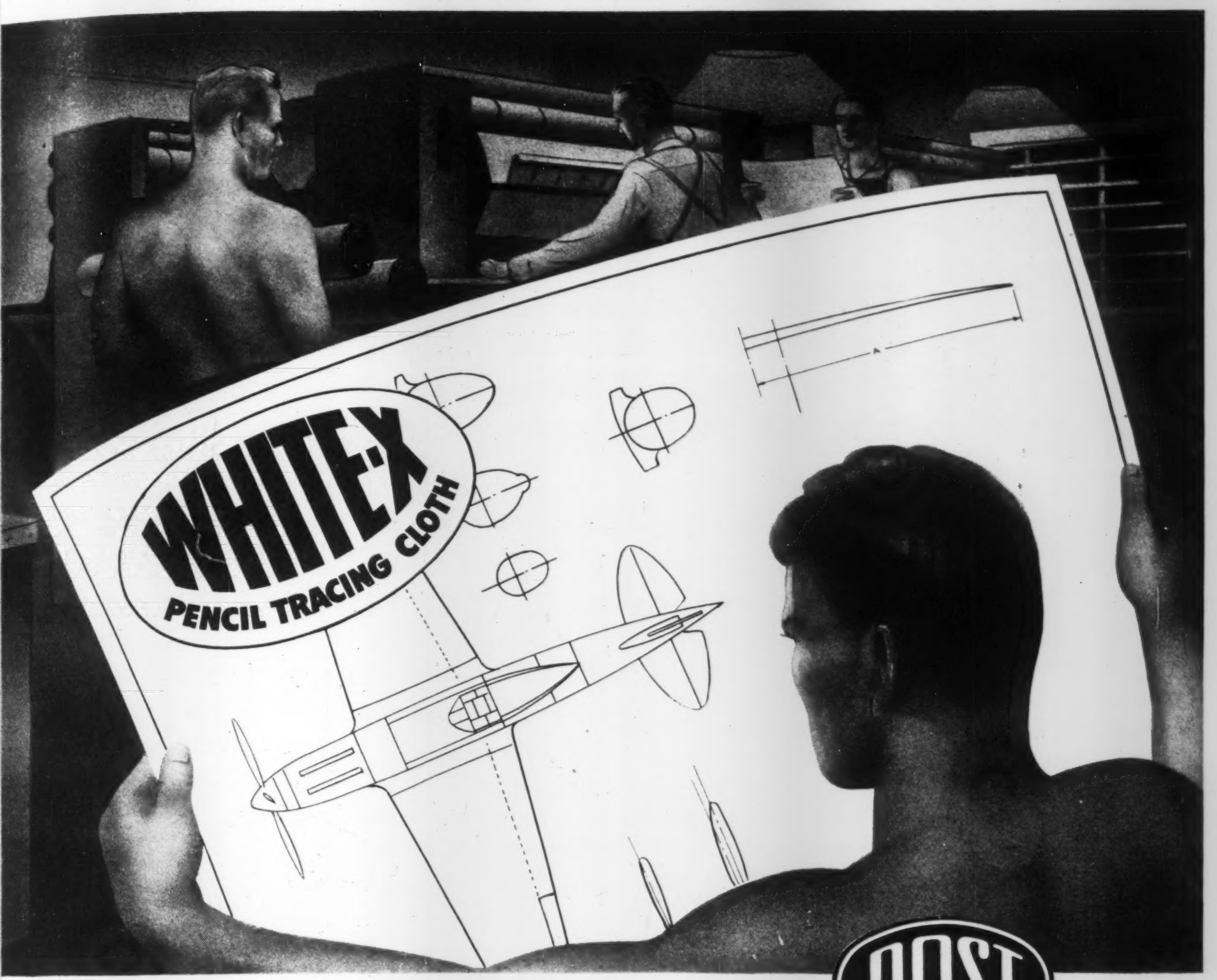
SIMPLON TUNNEL. Civil Engineer's Contribution to Civilization, C. E. Inglis. *Soc. Engrs.—J. & Trans.*, vol. 33, no. 2, July–Dec., 1942, pp. 63–67. History of civil engineering with particular attention to account of construction of Simplon Tunnel, considered by author as greatest epic in history of engineering; present and future trends.

SUBWAYS, CHICAGO, ILL. Relocation of Utility Substructures—Chicago Subway, J. B. Jackson. *Western Soc. Engrs.—J.*, vol. 48, no. 1, Mar. 1943, pp. 3–13. Some of engineering aspects of problem are discussed.

SUBWAY CONSTRUCTION, BUENOS AIRES. Buenos Aires Underground Railway, E. Kindel. *Engineer*, vol. 175, nos. 4546, 4547, Feb. 26, 1943, pp. 166–169, Mar. 5, pp. 184–187. Illustrated description of work involved in course of constructing extensions to underground railway system of Buenos Aires in Argentine Republic. From *Ingenieria*, Mar. and Apr. 1942.

SUBWAY CONSTRUCTION, LONDON. Concrete Blocks Used to Line Shield-Driven Tunnel in London, G. L. Grove. *Eng. News-Rec.*, vol. 130, no. 22, June 3, 1943, p. 107. Precast lining segments of reinforced concrete similar in shape to conventional cast iron segments, bolted together in same way, have been tried experimentally in tunnel construction on underground railway extension by London Passenger Transport Board; according to author such segments have never before been used in shield tunneling. Brief abstract of paper before Instn. Civ. Engrs.

WATER SUPPLY, ANTIQUITY. Eupalinos—First Civil Engineer, F. R. Bichowsky. *Compressed Air Mag.*, vol. 48, no. 7, July 1943, pp. 7086–7090. Historical notes on planning and construction of water-supply tunnel on Island of Samos, begun about 540 B.C. and completed in about 15 years; tunnel was designed by Eupalinos, son of Naustrophus; survey data; tunnel is 3,300 ft long and original bore was 8 by 8 ft in section; other works of Eupalinos are mentioned.



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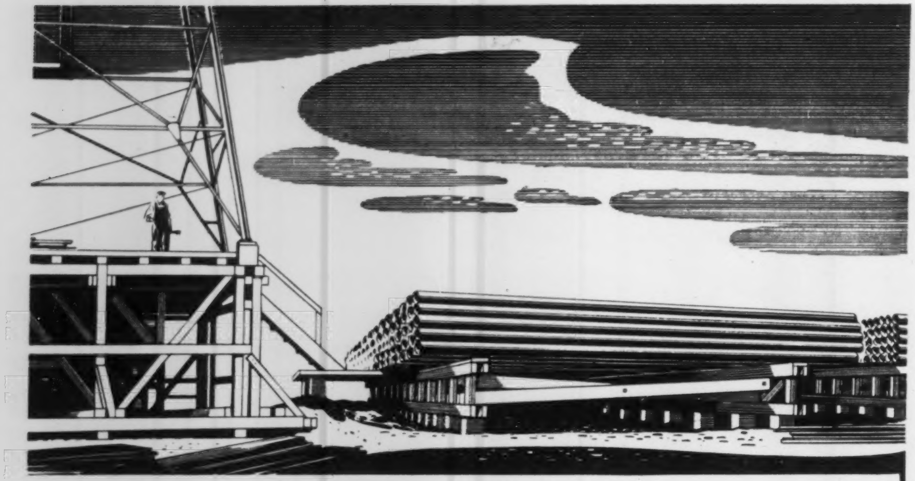

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WATER PIPE LINES

Aqueducts, Switzerland. 2,000-Year-Old Aqueduct Functioning in Switzerland. *Water Works Eng.*, vol. 96, no. 13, June 30, 1943, p. 748. Brief note on crude system consisting in part of hollowed-out logs carries mountain water to lowland areas.

Concrete. Wire-Wound Prestressed Concrete Pressure Pipe, R. B. Creops. *Am. Concrete Inst.—J.*, vol. 14, no. 6, June 1943, pp. 545–555. Description of manufacture of, and simplified design for, concrete shell reinforced by wrapping prestressed wire around it to give pipe structural properties for water lines, in which high hydrostatic pressures can be carried; hint as to possible use of pipe of this type for culvert purposes is included.

WATER PUMPING PLANTS

Drainage, Great Britain. Pumping Plant for Flood Protection. *Engineer*, vol. 175, nos. 4559, 4560, May 28, 1943, pp. 432–433; June 4, pp. 452–453. Illustrated description of pumping plant in southern England; scheme consists essentially of collecting flood water from north side of river and taking it, via aqueduct, under river to south side, where station has been built; total area of 49,000 acres drained by new pumping station.

WATER RESOURCES

Airplane Plants. FWA Project of 22 mgd for Air Craft Plant Supply, L. R. Howson. *Water Works Eng.*, vol. 96, no. 11, June 2, 1943, pp. 557–560. Project described consists of 11 gravel-packed wells drilled in Miami well field south of Hamilton, Ohio, 15 miles from Wright Aeronautical Corp.; 20 miles of reinforced concrete pressure pipe and 15-mg reservoir are included in project.

Military Engineering. Japanese Water Supply on Airport at Guadalcanal, R. D. Kirkpatrick. *Military Engr.*, vol. 35, no. 212, June 1943, pp. 276–277. Water supply system found on Guadalcanal as prepared by Japanese is described; system includes pumping water from river into storage tanks on hill, from where gravity causes it to flow down to airport where it is used for construction and drinking purposes; drinking water is filtered by Shofu cylinder, description of which was previously indexed from issue of March 1943.

WATER TREATMENT

Aeration. Compressed Air Is Utilized in Water Purification, A. J. Nauta. *Water Works Eng.*, vol. 96, no. 12, June 16, 1943, pp. 678–680. Diverting of chemicals to war needs has created need for new methods of purification; system using aeration for iron removal in filtration plant is described.

Chlorination. Some Practical Aspects of Handling Chlorine, C. F. Bingham. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 171–173. Essential properties of chlorine; methods of avoiding condensation troubles; container temperatures and pressures; handling containers; flexibility of treatment.

Excess-Lime Treatment. Relative Resistance of Coliform Organisms and Certain Enteric Pathogens to Excess-Lime Treatment, E. Wattie and C. W. Chambers. *Am. Water Works Assn.—J.*, vol. 35, no. 6, June 1943, pp. 709–720. Laboratory tests were instituted to determine bactericidal efficiency of excess-lime method of water treatment as exhibited against common water-borne pathogens and standard indicator organisms, coliform group; report presents information obtained concerning this phase of study.

Filtration Plants, Atlanta, Ga. 50 Years Young, P. Weir. *Southern Power & Industry*, vol. 61, no. 6, June 1943, pp. 70–75. Rustproofing and waterproofing as applied to filters and related equipment in filtration plant.

Filtration Plants, Calgary, Alberta. Results at Calgary's New Filtration Plant, W. E. Robinson. *Eng. & Contract Rec.*, vol. 56, no. 22, June 2, 1943, pp. 13–15, 21–22. Brief description of plant; source of supply; Glenmore reservoir; pumping station; coagulation; settling basins; filters; wash water supply; chemical house; taste and odor control; hydraulic valves; filter valves; operating practice. Before Am. Water Works Assn.

Filtration Plants, Cleveland, Ohio. Filter Plants at Cleveland, L. A. Marshall. *Water Works Eng.*, vol. 96, no. 11, June 2, 1943, pp. 597–598. Treatment methods, treatment results by steps, with detailed costs given for each plant.

Filtration Plants, Maintenance and Repair. Filter Bed Maintenance, E. C. Goehring. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 155–157. Year's experience with this form of surface-agitation device indicates that such troubles as mudballs, surface cracks, bed shrinkage, hard spots, and sand coatings removable by abrasion, can be effectively removed and beds maintained in good condition; definite economy in use of wash water can be expected after beds have been cleaned.

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OZONE. Ozone Treatment of Water, V. Hann. *Am. Water Works Assn.—J.*, vol. 35, no. 5, May 1943, pp. 585–591. Early ozone treatment plants; disinfection; color removal; taste and removal; cost of ozone treatment; future for ozone treatment. Bibliography.

STANDARDS. Explanation of Chemical and Bacteriological Requirements of New Drinking-Water Standards. *Water & Sewage*, vol. 81, no. 5, May 1943, pp. 23–24, 42–44. Article comprises Part IV of Manual of Recommended Water Sanitation Practice issued in conjunction with revised drinking water standards of U.S. Public Health Service; explanatory discussion of chemical and bacteriological requirements of standards; principles that guided members of Advisory Committee on Official Water Standards in framing requirements set forth in text of standards.

STANDARDS. New Drinking Water Standards. *Water Works Eng.*, vol. 96, no. 9, May 5, 1943, pp. 443–445, 460–461. Public Health Service standards as now established are given; while standards were established for and actually apply only to drinking and culinary water, supplied by common carriers in interstate commerce, they have been adopted by water supply field as guide in judging suitability of water for human consumption.

TASTE AND ODOR CONTROL. Calculation of Threshold Odor, H. A. Thomas, Jr. *Am. Water Works Assn.—J.*, vol. 35, no. 6, June 1943, pp. 751–769. To evaluate more fully potentialities of nose in precise measurement of odor, important developments of past that have bearing upon precision are considered; water dilution method; precision of odor measurement; development of one-man test; rating of activated carbons; conclusions. Bibliography.

TASTE AND ODOR CONTROL. Taste and Odor Control with Activated Carbon, E. A. Sigworth. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 141–142. Method and points of application described; application before and after coagulation; effect of other chemicals.

WATER ANALYSIS, CHLORINE DETERMINATION. Variability in Normal Chloride Content of Surface and Ground Water Supplies in Massachusetts, F. H. Kingsbury and E. W. Smith. *New England Water Works Assn.—J.*, vol. 57, no. 1, Mar. 1943, pp. 10–14. Results of study made of available analyses extending over period since 1890, to determine whether variation was due to rainfall; studies indicate that correlative inverse variation does exist.

WATER ANALYSIS. Characteristics of Natural Waters, C. Wilson. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 121–122. Outstanding effects upon water of principal constituents of dissolved mineral load; because water spoilage and growths giving rise to it are of such vital importance to water works operator, special consideration will be given to biological significance of several of these constituents.

WATER ANALYSIS. Determination of Sand in Well Water, G. C. Bunker. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, p. 228. Brief account of method of determining volume of sand in well water by sampling as developed in water analysis laboratory of Ministry of Public Works of Venezuelan Government.

WATER CHLORINATION. Progress Report on Studies of Water Chlorination, H. W. Streeter. *Am. Water Works Assn.—J.*, vol. 35, no. 4, Apr. 1943, pp. 421–426. Results to date of investigations carried out at U.S. Public Health Service Station, Cincinnati, Ohio, on methods and control of chlorination; special attention devoted to theory and practice of "break point" method; bacteriological experiments; break point chlorination. Bibliography.

WATER SOFTENING. Design and Operation of Softening Plant at Aliquippa, Pa., E. V. Grimshaw. *Water Works Eng.*, vol. 96, no. 12, June 16, 1943, pp. 684–687. Mixing chamber and settling basin, chemical feed and controls, laboratory, and pumping, and miscellaneous equipment are described.

WATER SOFTENING. Water Softening, C. P. Hoover. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 144–147. History of water softening with lime since 1766; economic aspects; soap losses.

WATER WORKS ENGINEERING

BECKLEY, W.VA. New Water Supply of Beckley, West Virginia, W. D. Kelley, *Water Works & Sewerage*, vol. 90, no. 5, May 1943, pp. 153–158. Details of new source of water supply developed for this community; dam and reservoir; purification plant and pumping station; aerator and mixing chamber; sedimentation basins; filters; chemical equipment; laboratory; pumping equipment; new storage tank; semi-automatic rate of flow control; supply mains of steel pipe; costs.

EMERGENCY. Auxiliary Water Supplies for Emergency Service, E. L. Holloway. *Am. Water Works Assn.—J.*, vol. 35, no. 6, June 1943, pp. 701–708. Auxiliary water supplies for Flint, Mich., and San Francisco; other development methods; recommendations of National Board of Fire Underwriters; inventory of possibilities; health considerations; reserve equipment and supplies.

GEOLOGY, SOUTH DAKOTA. Two Deep Water Wells near Rapid City, South Dakota, J. P. Gries. *Am. Assn. Petroleum Geologists—Bul.*, vol. 27, no. 5, May 1943, pp. 646–650. Two wells drilled at airport during 1942—the first deep wells put down close to east edge of Black Hills uplift—offer opportunity to compare stratigraphy and structure as observed in outcrops with that present below surface, a few miles east; log of No. 2 well, 4,436 ft deep.

HAMPTON ROADS, VA. Hampton Roads Expansion Work Nears Completion, R. Newsom. *Water Works Eng.*, vol. 96, nos. 11 and 12, June 2, 1943, pp. 589–590, 593–594; June 16, pp. 681–683 and 701. Account of project, including filter plant (capacity of which is 6 mgd), and 17 miles of cast-iron transmission lines, principally of 30 and 20-in diameter.

HARTFORD, CONN. Hartford, Conn., District Supply Fills Wartime Need, W. A. Gentner. *Water Works Eng.*, vol. 96, no. 11, June 2, 1943, pp. 567–568. Major extensions started a decade ago satisfactorily provided for 25% increase in demand.

MANAGEMENT. Problems in Municipal Water-Works Management, L. R. Howson. *Water Works & Sewerage*, vol. 90, no. 6, June 1943, pp. 21–22. Financial policy, construction program, and economics of operation are discussed.

POSTWAR. Canadian Planning for Postwar Reconstruction, W. C. Miller. *Am. Water Works Assn.—J.*, vol. 35, no. 5, May 1943, pp. 549–555. Discussion of general pattern of postwar plans and reference to some of work of James' Committee on Reconstruction; waterworks projects; importance of planning; outline of consideration for evaluating postwar construction projects.

POSTWAR. Engineering Contributions to Postwar World, S. B. Morris. *Water Works Eng.*, vol. 96, no. 11, June 2, 1943, pp. 554–556, 616. New materials and processes may profoundly influence water works and other fields.

POSTWAR. New Horizons for Water Service, E. J. Cleary. *Eng. News-Rec.*, vol. 130, no. 22, June 3, 1943, pp. 827–837, 840. To aid in formulation of desirable objectives as well as establishment of program leading to their accomplishment, exploratory study has been undertaken; concerned only with new horizons on domestic scene, study is arranged in four parts: (1) where we stand today; (2) facing tomorrow's horizons; (3) evaluating community needs; and (4) statement on trend of technical advances.

POSTWAR. Postwar Reconstruction of Water Works Systems, W. C. Miller. *Eng. & Contract Rec.*, vol. 56, no. 18, May 5, 1943, pp. 14–16, and 26. Factors to be taken into consideration in study of postwar reconstruction of water works; competitive bidding on jobs advocated; improved distribution systems; advantages of elevated tanks; adequate treatment for surface supplies; author states that complete data should be prepared now. Before Am. Water Works Assn.

PROTECTION. Maintenance of Water Supply Under War Conditions. *Instn. Water Engrs.—Trans.*, vol. 47, 1942, pp. 156–169, (discussion) 169–170. Bombing effects; repairs to mains and other works; protection of works rationing and sources of supply; emergency water distribution; relations with consumers.

PROVINCETOWN, MASS. Water Supplies and Iron Removal Plant, Provincetown, Mass., P. F. Howard. *New England Water Works Assn.—J.*, vol. 57, no. 1, Mar. 1943, pp. 63–72. Brief historical background and account of recent developments; experiments made to determine satisfactory way to remove excessive amounts of iron from water; experiences with gravel-packed wells show water to be entirely satisfactory after treatment; general plan of wells and treatment works given.

WARTIME. Wartime Economy and Operation of Waterworks, E. G. B. Gledhill and A. W. H. McCanlis. *Instn. Water Engrs.—Trans.*, vol. 47, 1942, pp. 13–26, (discussion) pp. 26–42. Various wartime economies are described as follows: pumping stations; water treatment; distribution centers; laboratories and offices; reservoirs and grounds.

WARTIME OPERATION. Operating Water Department During Wartime, L. A. Smith. *Am. City*, vol. 58, no. 6, June 1943, pp. 56–57. Four phases of wartime problem briefly discussed—that is regulations of War Production Board, Mutual Aid Inventory system, precautions taken by Internal Security Branch of U.S. Army, and civilian defense.

WARTIME, UNITED STATES. Water Supply in Wartime, R. L. McNamee. *Am. Water Works Assn.—J.*, vol. 35, no. 6, June 1943, pp. 687–693. Statistical data pertaining to public water supplies of United States; importance of water supply to civilian population and to industrial production; water supply for armed forces in civilian communities and for fire defense; military value of civil water supplies; water supply situation in Michigan; mobilization for defense.

THE SATURDAY EVENING POST August 14th, 1943

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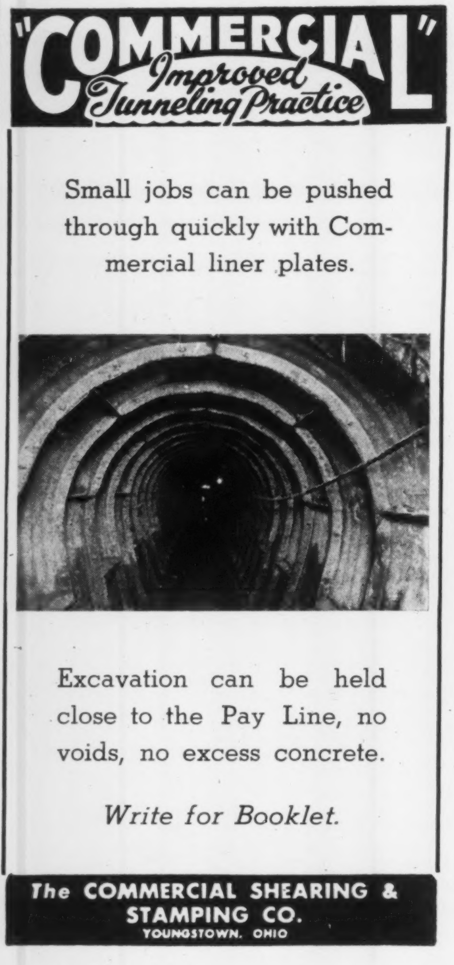
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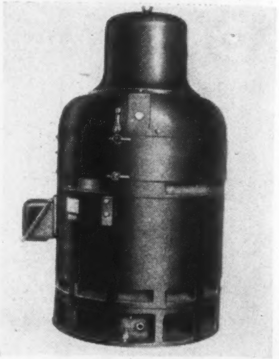
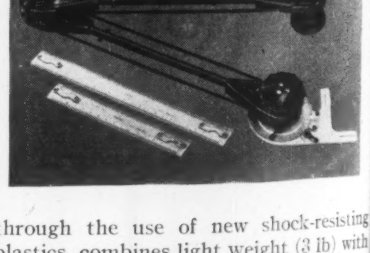


For protection, these motors have a drip-proof enclosure. They are streamlined throughout to provide a pleasing appearance, and their smoothly contoured lines will not easily collect dirt and dust. The top cover of the motor is easily removed to permit adjustment of the pump shaft. Easy access to the brushes and the collector rings is obtained by simply unlatching a flush-mounted steel plate.

The frames of these motors are of cast-iron construction, which provides strength to withstand the high-thrust loads often encountered in pump applications. The motors can be furnished with non-reverse ratchets to prevent reversal of pump rotation at shutdown or on starting. They are also available with solid-shafts.

Drafting Machine

A SMALL DRAFTING MACHINE which can be mounted on a portable board is being produced by the V & E Manufacturing Company of Pasadena, Calif. The new machine, called the Vemco Junior Drafter,



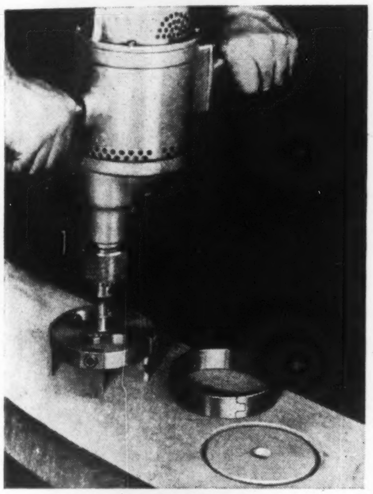
through the use of new shock-resisting plastics, combines light weight (3 lb) with many advantages. Accurate, parallel motion over the entire board; a full circle baseline setting; pre-lubricated and double-sealed ball bearings; and enclosed pulleys are a few of its features.

Disk brakes at anchor and elbow allow the drafter to be used on steeply inclined boards. The central skid button is plastic and will not mar the paper.

Light-weight aluminum scales are available in 8 in. and 12 in. lengths and fit into resilient, slotted chucks in the positive scale holder. The protractor is 3$^{3}/_{4}$ in. in diameter and graduated in degrees with figures by quadrants. The Vemco Junior Drafter is very flexible, so that the scales lie flat. Moreover, the head can readily be raised high off the board.

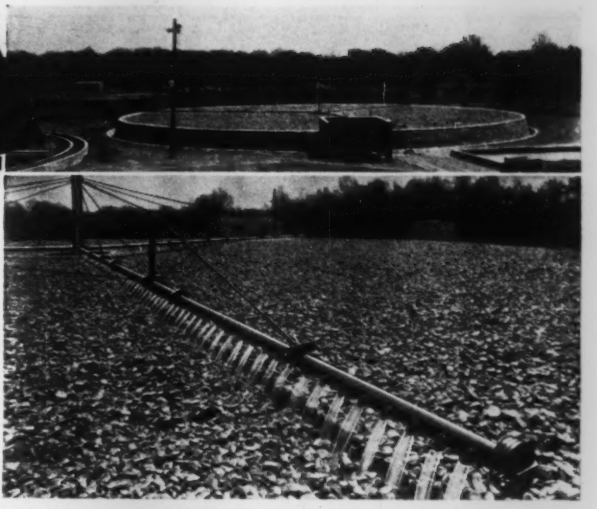
Tool Speeds Ring-Connector Construction

Timber construction of industrial buildings, aircraft hangars, mess halls, barracks, and other structures essential to the war effort has been greatly accelerated by the use of bolted ring-connector joints. As is generally known, this type of joint increases the load-carrying capacity of timber structures, and prevents bending and shearing of the bolts which often results from windsway, vibration, and "settling" of the structure.



An improved tool is being produced by the Circo Tool Co., 264 E. Ogden Ave., Milwaukee 2, Wis., for cutting the circular grooves for the rings or bearing plates. This circular groove cutting tool is powered by a portable electric drill, or may be used in a hand-operated brace and bit. The cutter is made with either two or four renewable blades for split rings from 2$^{1}/_{2}$ in. to 6 in. in diameter. A different type of cutting head, with inside blades, is furnished to countersink bearing plates of the same diameter as the connector rings.

Lindsay Structure—A new 8-page booklet entitled, "An Introduction to Lindsay Structure," has just been released by Lindsay and Lindsay, 222 W. Adams St., Chicago, Ill. This new booklet gives complete details, in words and pictures, of the simple step-by-step procedure of assembling Lindsay Structure. It also contains case histories on applications.



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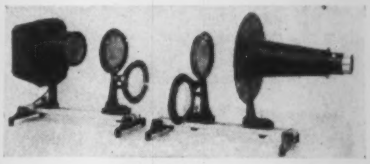

To the machine designer, photoelastic stress analysis is not only of value in the verification of calculations based on theoretical solutions, but also in the solution of problems where theoretical analysis is not available. Where weight and space must be conserved actual stress distribution is more important than stress indicated by theoretical analysis.

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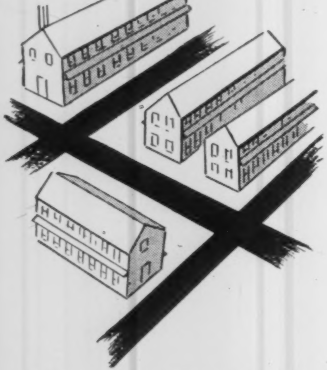

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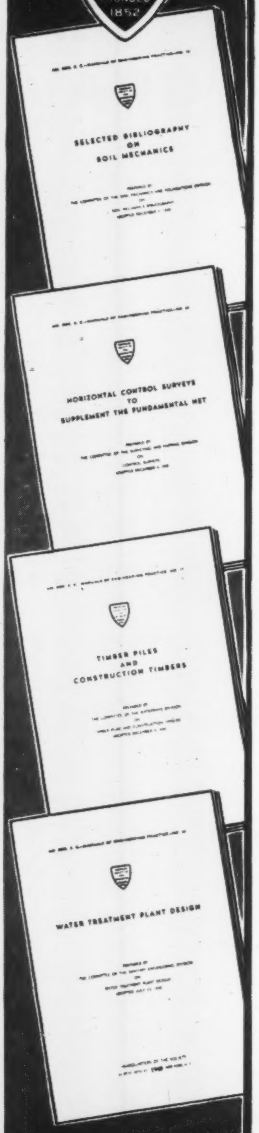

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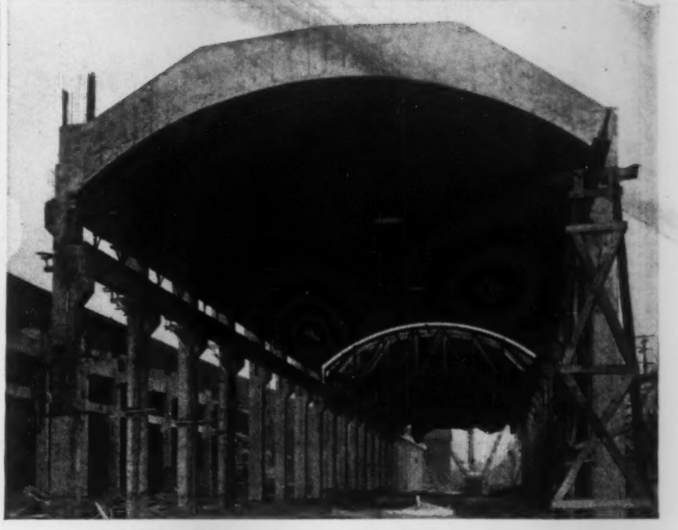

Traveling forms used in building barrel shell type roof of big Westinghouse plant are seen in background. Forms moved on rails on crane girders. Corbetta Construction Co., Inc., contractor. Roberts & Schaefer Co., consulting engineer.

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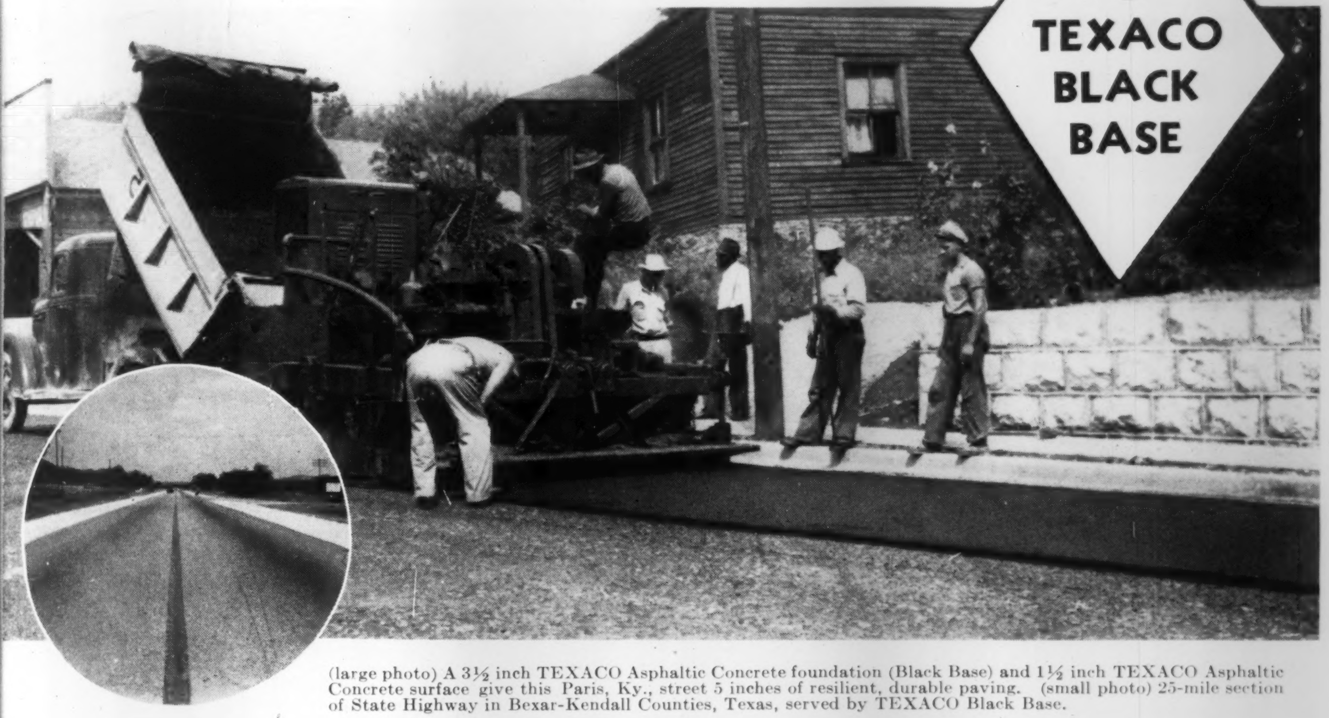
BLACK
BASE



(large photo) A 3½ inch TEXACO Asphaltic Concrete foundation (Black Base) and 1½ inch TEXACO Asphaltic Concrete surface give this Paris, Ky., street 5 inches of resilient, durable paving. (small photo) 25-mile section of State Highway in Bexar-Kendall Counties, Texas, served by TEXACO Black Base.

Years ago, some road builder referred to an Asphalt foundation as Black Base, and the name has stuck ever since. Black Base consists of coarse graded aggregate bound together by Asphalt Cement.

While TEXACO Asphalt wearing surfaces give years of economical service on all foundations, a TEXACO surface on Black Base has advantages no engineer can overlook.

TEXACO Black Base requires no curing period. It cools quickly to air temperature and is then ready for the surface. This speeds construction . . opens the street, highway or airport to traffic days ahead of a pavement which must be cured.

The same equipment used to mix and construct Black Base is used to mix and construct the Asphalt wearing surface.

A perfect bond forms between Black Base and Asphalt wearing surface, producing a well-knit, resilient structure from top to bottom.

Because TEXACO Black Base is flexible, it maintains contact with the subgrade, insuring permanent subgrade support. That's why the combined thickness of Black Base and Asphalt surface needed is less than the required thickness of a rigid type of construction, resulting in a proportionately lower cost.

The most common type of TEXACO Black Base is plant-mixed Asphaltic Concrete. However, Asphalt Macadam constructed by the penetration method also is used with excellent results.

Include TEXACO Black Base in your plans for post-war street, highway or airport construction. To help you with such plans, a TEXACO Engineer who specializes in Asphalt construction is at your service.

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DRIVE ON ASPHALT

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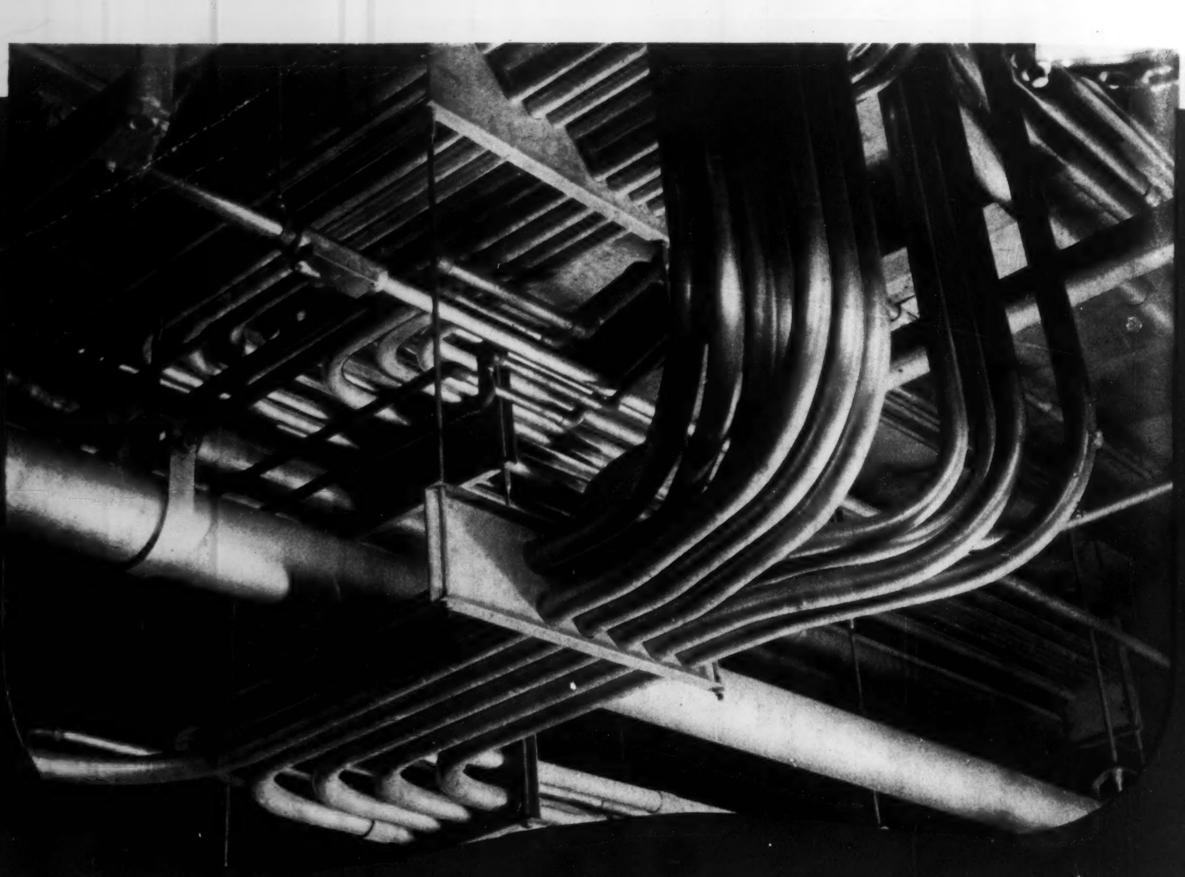

Aluminum Conduit

sound as the day it was installed

The electrical conduit you see in this picture carries important power and control circuits in a sewage treatment plant. Conditions there are conducive to corrosion, but this conduit is "good as new" after seven years of service. No rusting to destroy the conduit or cause trouble with the wiring.

Of course, you can't buy Alcoa tubing for conduit today, although tons of tubing are being made. It's all going into airplanes and other fighting equipment. But the splendid performance of prewar installations suggests that aluminum tubing may be a "must" for those postwar jobs where corrosion is likely to be a problem.

Light in weight, aluminum conduit places less burden on its supports. It is easy to fabricate and install. Fittings will become available as soon as metal is released for peacetime projects. These advantages, added to its long, trouble-free life, make Alcoa Aluminum tubing a most economical material to use.

As you draw up plans for postwar construction, you should be considering the advantages offered by aluminum conduit and other Alcoa Aluminum products. We'll gladly send you any data you need. Write Aluminum Company of America, 2127 Gulf Building, Pittsburgh, Pennsylvania.

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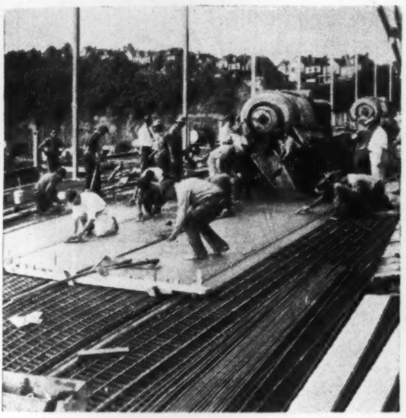
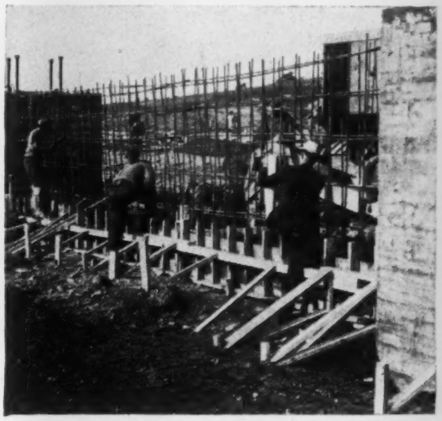


U·S·S I-BEAM-LOK. Fast and easy installation distinguish this lightweight, heavy-duty, steel bridge flooring. Also recommended for the rapid construction of heavy-duty factory floors, ramps, wharfs, docks and similar structures subjected to heavy loads and high-speed traffic. By saving weight in the floor, you can save steel in the supporting structure. Available both in Open and Concrete-filled types.



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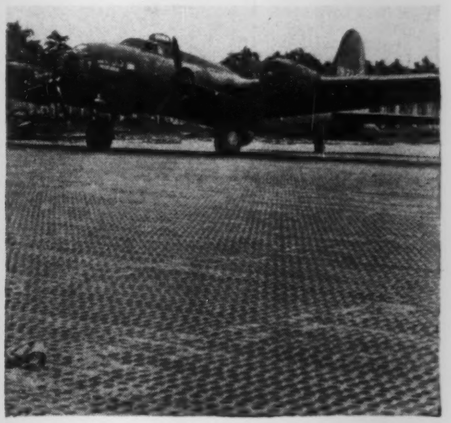

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City, Mo. (Age 31) (Claims RCA 4.1 RCM 2.6) April 1941 to date with Marshall & Brown, Archts. and Engrs.; previously with Ash-Howard-Needles & Tammen; with James D. Marshall, Cons. Engr.

Illerich, Ottomar Theodore, Sacramento, Calif. (Age 48) (Claims RCA 8.1 RCM 15.7) Oct. 1935 to date Associate Bridge Design Engr., California Bridge Dept.

Karrer, Emmett Herman, Arlington, Va. (Age 36) (Claims RCA 7.7 RCM 3.1) July 1935 to date with U.S. PRA in various capacities, since June 1942 as Associate Highway Engr., also acting as Liaison Officer with Conservation Div., WPB.

Komline, Thomas Raymond (Junior), Bound Brook, N.J. (Age 31) (Claims RCA 1.3) June to Nov. 1942 San. Engr., and Nov. 1942 to date Operations Engr., Camp Kilmer, New Brunswick, N.J.; previously with Joint Sewer Comm.

Levy, Marcus Westerfeld (Junior), San Francisco, Calif. (Age 28) (Claims RCA 6.9) Nov. 1940 to date with Corps of Engrs., U.S. Army, as 1st Lt. and (since Sept. 1942) Capt.; previously in private architectural practice with A. L. Levy, Sr., Chicago, Ill.

Lippincott, Lester Emmert, Sacramento, Calif. (Age 40) (Claims RCA 4.0) May 1937 to Dec. 1938 Engr. Aid, and Feb. 1941 to date Jun. Bridge Engr., California Div. of Highways; in the interim with Bureau of Eng., California Div. of Fish and Game, San Francisco.

Long, Jack Yervant (Junior), Los Angeles, Calif. (Age 29) (Claims RCA 4.2) Aug. 1941 to date Squad Leader and Asst. Staff Engr., D. R. Warren Co.; previously with Div. of Highways, State of California, as Laboratory Aid, then Jun. Structural Eng. Draftsman.

Merchant, Ivan Darrel, Salem, Ore. (Age 38) (Claims RCA 8.7 RCM 3.0) March 1929 to date with Bridge Dept., Oregon Highway Dept., in various capacities, since Dec. 1936 as Designing Engr.

Mitchelhill, James Moffat (Junior), Miles City, Mont. (Age 31) (Claims RCA 2.5) Sept. 1935 to date with Chicago, Milwaukee, St. Paul & Pacific R.R. Co. in various capacities, since Jan. 1942 as Instrumentman, Div. Engr.'s Office, Miles City.

Nyquist, Earl Sidney, Corte Madera, Calif. (Age 29) (Claims RCA 0.5 RCM 1.7) July 1941 to date with Dist. Engr.'s Office in various capacities, since Nov. 1942 being Head of Eng. Sec., Fortification Div.; previously with Office Eng. Div., The Panama Canal; Jun. Eng. Draftsman, TVA, Knoxville, Tenn.

Roberts, Alan Edward, Edmonton, Alberta, Canada. (Age 32) (Claims RCA 3.9 RCM 1.6) Feb. 1943 to date Engr. Designer, Metcalfe, Hamilton & Kansas City Bridge Co.; previously Engr. Designer, Giffels & Vallet, Inc.; County Engr., Butler County, Nebr.

Robins, Harry Harper, Napa, Calif. (Age 54) (Claims RCA 25.0) Aug. 1940 to date Asst. Engr., U.S. Engr. Office; previously Asst. Dist. Engr., New Mexico Highway Dept., Santa Fe.

Sinacori, Mariano Nicholas (Junior), Gilbertsville, Ky. (Age 33) (Claims RCA 4.2) 1935 to date with TVA in various capacities, since May 1941 as Associate Materials Engr. at Kentucky Dam.

Soderstrand, Styles Arthur (Junior), Oakland, Calif. (Age 34) (Claims RCA 4.9 RCM 2.4) May 1941 to date with Moore Dry Dock Co., in various capacities, since May 1943 as Plant Constr. Engr.; previously on active duty as Lt. (jg), CEC, USNR, Public Works Office, Twelfth Naval Dist., San Francisco, Calif.

Stollard, Julian Howard (Junior), San Francisco, Calif. (Age 30) (Claims RCA 3.2) Nov. 1942 to date Safety Engr., Loss Prevention Dept., Liberty Mutual Insurance Co.; previously Jun. Hydr. Engr., U.S. Geological Survey; Jun. Chemist, Atlanta Water Wks., Atlanta, Ga.

Swanson, Morby, Sacramento, Calif. (Age 39) (Claims RCA 4.2) May 1929 to date with California Div. of Highways in various capacities, since Aug. 1936 as Asst. Highway Engr.

Thrane, Conrad, New York City. (Age 38) (Claims RCA 1.0 RCM 10.3) 1940 to date traveling, study and inspecting engineering works; previously in private contracting practice, Buenos Aires.

van der Goot, Herbert Albert, Monrovia, Calif. (Age 34) (Claims RCA 4.4) May 1930 to date with Los Angeles County Flood Control Dist. in various capacities, since March 1939 as Hydrographer and Civ. Engr.

Ward, Patrick James, New York City. (Age 53) (Claims RCA 8.8) 1942 to date with U.S. War Dept., Army Engr. Corps, Intelligence Branch, Engr. Reserve Office, as French Translator of articles, etc.; previously with WPA, New York City.

APPLYING FOR JUNIOR

Amoroso, Gabriel Robert, New York City. (Age 23) Nov. 1942 to date with C.A.A., airways engineering; previously with TVA; Asst., Soil Mechanics Laboratory, Columbia Univ.

Campbell, Linden Carlyle, Overland Park, Kans. (Age 27) June 1942 to date Detailer, Fluor Corporation, Ltd.; previously Draftsman and Detailer, Burns & McDonnell Eng. Co.; Instrumentman, J. E. Dunn Constr. Co.

Fenner, John Sherrod, Jr., San Jose, Costa Rico. (Age 28) (Claims RCA 1.4) Aug. 1942 to date with U.S. Engr. Dept., as Asst. Engr. and at present Engr., Pan American Highway; previously Chf. of field party, Eng. Dept., Corpus Christi, Tex.; and with various other companies in Corpus Christi.

Guralnick, Irving Milton, New York City. (Age 23) June 1943 to date Structural Designer, Mackenzie, Ashley and Bogert; previously Civ. Engr., Tuttle, Seelye, Place and Raymond.

Hummel, Roland Luther, Storrs, Conn. (Age 24) Sept. 1942 to date Instructor in Civ. Eng., Univ. of Connecticut; previously Detailer, The American Bridge Co., Trenton, N.J.

Vera-Sanchez, Justo Gentil, Iowa City, Iowa. (Age 29) (Claims RCA 1.4) Sept. 1942 to date graduate student, State Univ. of Iowa; previously Engr. of Public Utilities, Bureau of Public Works, Dept. of Bolivar, Cartagena, Colombia, S.A.

Watkins, James Elzy, Vicksburg, Miss. (Age 30) (Claims RCA 0.3) Dec. 1937 to date with U.S. Waterways Experiment Station, Vicksburg, in various capacities, since Sept. 1942 being Asst. Engr., Project Engr., and Chf. of Field Exploration Sec., Soils Div.

1942 GRADUATE

STATE UNIV. OF IOWA
(B.S. in C.E.)

	Age
Damerow, Kenneth Wright	(22)

1943 GRADUATES

ALA. POL. INST.
(B.C.E.)

Ingram, Lewis Riviere	(24)

BROWN UNIV.
(S.B. in Eng.)

Merdinyan, Philip Herbert	(21)

UNIV. OF CALIF.
(B.S. in Civ.Eng.)

Allen, Thomas Albert, Jr.	(25)
Anderson, Robert Whitney	(27)
Beller, Gordon Melvin	(25)
Bernhard, Stanley John	(21)
Brosterhous, Ray Louis	(27)
Brown, Wilbern Glen	(23)
Colley, Robert Frances	(22)
Cooperrider, Verne Keith	(22)
Curtis, Charley Cruse	(21)
Dare, Robert Wye	(22)
Darrow, Chester Harold	(20)
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Fong, Harold Yin Geck	(24)
Geyer, Joseph Fernand	(25)
Graff, John Theodore	(23)
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White, Robert Uhl	(22)
Wilson, Ray Junior	(22)

COLO. STATE COLL.
(B.S.)

Wood, Carroll Hamilton	(22)

COOPER UNION
(B.C.E.)

Squire, Frank	(20

DREXEL INST. TECH.
(B.S. in C.E.)

Heisler, William Christian	(22)
Lawson, Edward Clinton	(23)
Pearson, Robert Howard	(23)
Roth, John Albert	(22)
Rumpf, John Louis, II	(22)
Vill, Joseph L.	(23)

IOWA STATE COLL.
(B.S.)

Streiff, Maurice Leland	(21)

KANS. STATE COLL.
(B.S. in C.E.)

Kent, Lacey Lee	(21)
Smith, Larry William	(21)
Woods, Clyde, Jr.	(22)

UNIV. OF KANS.
(B.S. in C.E.)

Asel, Bernley Miles	(21)
Duckett, Hubert Preston, Jr.	(23)

UNIV. OF KY.
(B.S. in C.E.)

Rappleyea, Guy John, Jr.	(22)
Schubert, Paul Richard	(21)

MICH. COLL. OF MIN. & TECH.
(B.S. in Civ.Eng.)

Abramson, Ralph Carl	(21)
Christensen, Raymond Earl	(21)
Graves, Stanley Anderson, Jr.	(22)

UNIV. OF MICH.
(M.S. in Struc. Eng.)

Sofyanos, Sofyanos John	(22)

UNIV. OF MINN.
(B.C.E.)

Berry, Clayton Arthur	(21)
Demarais, Virgil Francis	(25)
O'Hare, Don Robert	(21)

MISS. STATE COLL.
(B.S.)

Dulin, James Walter	(21)

MO. SCHOOL OF MINES & MET.
(B.S. in C.E.)

Davis, James Warren	(21)
Jett, Glendon Dewey	(22)
Keevil, Albert Sidney	(22)
Mitchell, Charles Kenneth	(20)

UNIV. OF NEBR.
(B.S. in C.E.)

Briggs, George Wendell	(22)
Knott, Robert John	(22)

COLL. OF CITY OF N.Y.
(B.C.E.)

Switzky, Harold	(21)

UNIV. OF TENN.
(B.S. in C.E.)

Hagler, Thomas	(23)
Jett, George Blackwell	(21)
Niles, Charles Fernald, Jr.	(22)

UNIV. OF UTAH
(B.S. in C.E.)

Varley, Charles Raymond	(22)

UNIV. OF WASH.
(B.S. in Civ.Eng.)

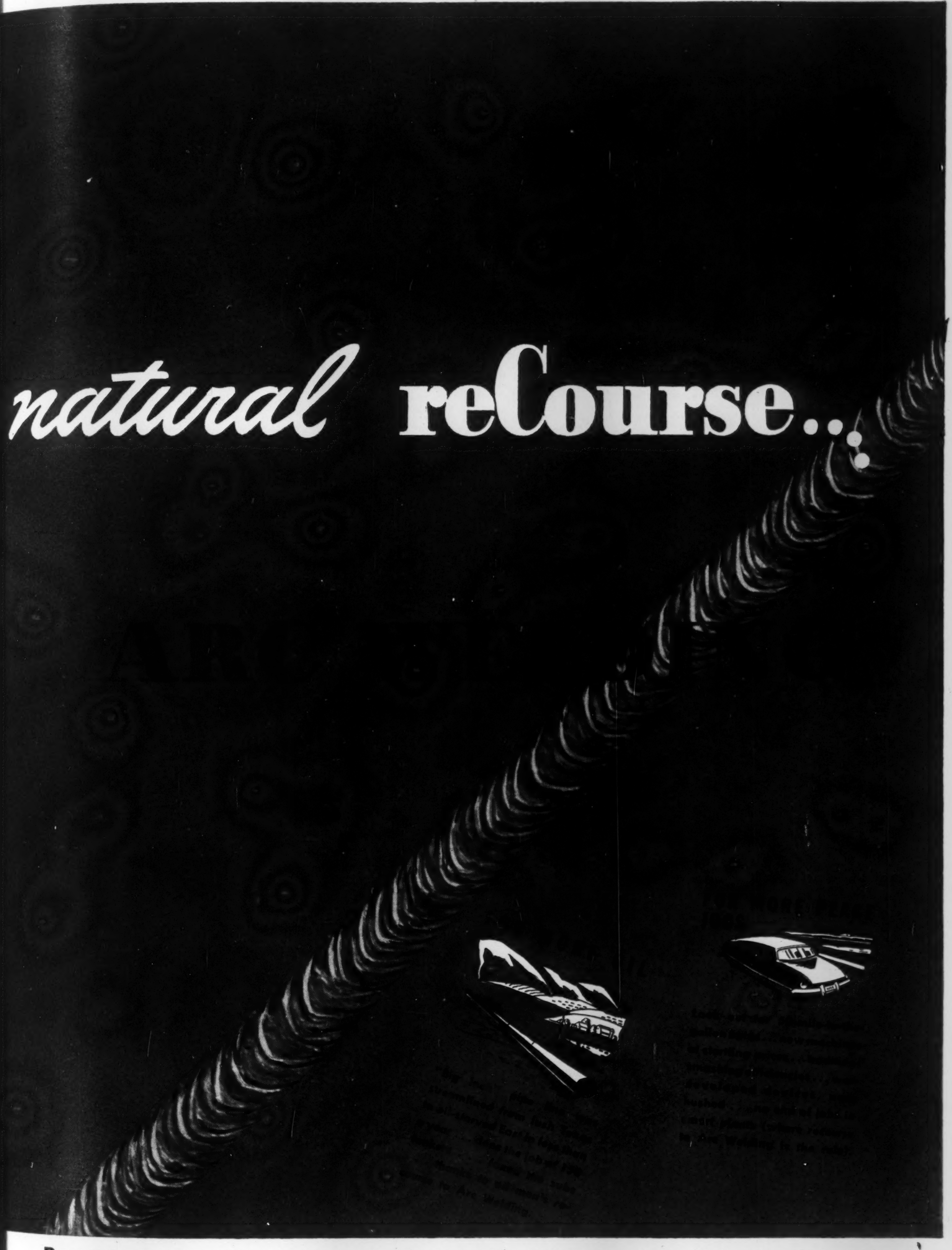
Nelson, Herbert Willard, Jr.	(23)

UNIV. OF WYO.
(B.S. in C.E.)

Anderson, James	(21)
Glode, John	(21)
Hargreaves, George Henry	(27)
Thomas, Donald Davis	(21)

The Board of Direction will consider the applications in this list not less than thirty days after the date of issue

[Editor's Note: Thomas G. Banks, Assoc. M. Am. Soc. C.E., has been Senior Engineer for the U.S. War Department since October 1941, instead of Engineer, as stated in the list published in September.]


natural reCourse...

Recourse: According to Webster, "a going to for aid or protection"

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A weekly bulletin of engineering positions open is available to members of the cooperating societies at a subscription of $3 per quarter or $10 per annum, payable in advance.

MEN AVAILABLE

Professor of Civil Engineering; M. Am. Soc. C.E.; age 52; S.P.E.E.; N.S.P.E.; licensed professional engineer (civil, structural); B.S. in C.E., C.E., M.S. (major, structural; minor, highways); 13 years' successful teaching (one location); 14 years' varied practical experience. Present position, design and construction. Desires teaching position. C-12.

Civil Engineer; Jun. Am. Soc. C.E.; 26; certified professional engineer, Virginia; B.S.E.; married; 4-F, not physical disability; $4^{1}/_{2}$ years' experience, including drafting, surveying (field and office), street and storm sewer design and computing for surveying and subdivision work; at present employed in non-war work as office engineer for highway engineer and surveyor. Desires position with organization now engaged in war work and anticipating a progressive post-war future. C-13.

Engineer; Assoc. M. Am. Soc. C.E.; C.E. and registered professional engineer; 40; 17 years (7 industry and 10 government), all types of construction including railroad, highway dams, airports), 12 of which in supervisory capacity over control of quality of construction. Well grounded in concrete, soil mechanics and stabilization, bituminous and other construction materials in general; member leading technical societies. C-14.

Civil Engineer; Assoc. M. Am. Soc. C.E.; 36; B.S.C.E. and M.C.E.; 10 years' experience in hydraulic and structural design and construction on water supply, hydroelectric, and industrial plant projects and appurtenant structures. Supervision of design and preparation of preliminary studies. C-15.

Civil Engineer; M. Am. Soc. C.E.; age 61; executive and manager. Recently completed design and supervision of construction of 70.5-mgd water supply for government project; 17 years in water supply as engineer, superintendent, chief engineer, and manager. Also wide experience in railroads, roads, and heavy construction both as designer and superintendent of construction. Several years' experience in Latin-America. Speaks and writes Spanish. C-16.

Engineer; Assoc. M. Am. Soc. C.E.; B.S. and M.S. in C.E.; 15 years' design and construction experience. Hydraulics, concrete and general structural, costs and specifications on dams, highways, canals, flood works, pipelines, power houses, industrial buildings, and concrete chemical tanks. Some stress analysis and piping. Rapid, economical work with minimum critical materials. C-17.

Maintenance Engineer and Designer; Assoc. M. Am. Soc. C.E.; excellent draftsman. Designed over four million dollars of industrial structures for transportation, mining, and maintenance operating departments. Desires association with employers appreciating a diligent worker for a permanent type of position, which offers reasonably regular promotion for a producer. Starting salary not a controlling factor. C-18.

Structural-Mechanical Engineer; Assoc. M. Am. Soc. C.E.; licensed New York state; technical education; 20 years' experience; design, construction, maintenance; sales; structures, mechanical handling, equipment. C-19.

Graduate Civil Engineer; Assoc. M. Am. Soc. C.E.; 12 years' experience on design and construction of water supply systems, and investigation and report on water conservation and flood control improvements; fiscal reports and other related work. Speak Spanish. Licensed in California. Location of employment not material. C-20.

Civil Engineer; Jun. Am. Soc. C.E.; 30; B.S.C.E.; licensed professional engineer in New York; 8 years' varied experience, including surveying, structural design of bridges and industrial buildings, and sewerage; technical author. First Lieutenant, AUS; expects retirement for medical reasons preventing service in combat zones. Prefer Northeastern United States or California. C-21.

Civil Engineer; Assoc. M. Am. Soc. C.E.; graduate engineer; registered and professional engineer; extensive experience in heavy industrial construction and industrial plant maintenance. Railroad location and construction in the Virginias and Kentucky. Capable executive and organizer. Draft exempt. C-22

POSITIONS AVAILABLE

Office Engineer, mechanical or civil, preferably with some shipyard experience, to plan and expedite work and materials. Will act as assistant to general manager of shipyards. Salary, $3,600–$4,800 a year. Location, East. W-2404.

Structural or Architectural Draftsman. Prefer men with industrial building background. Salary, $3,300–$3,900 a year; 40-hour week plus overtime. Location, Delaware. W-2443(*a*).

Structural Designers who have had some industrial building design. Work may develop into permanent job. Salary, about $4,000 a year. Location, Connecticut. W-2504.

Designing Engineer. Man who has had some hydroelectric experience, particularly on dams, spillways, power house, etc. Salary, $7,000–$7,500 a year. Location, Puerto Rico. W-2631.

Civil Engineering Teachers for war-training program. Background should be in the fields of elementary surveying, applied mechanics, materials laboratory, or sanitary engineering. Salary, $2,700–$3,900 a year, depending upon education and experience. Location, Southwest. W-2684.

Construction Engineers for field and office work in connection with airport construction. Some will be used to make field surveys and work up plans in office. Must be free to leave country. Salary open. Location, South America. W-2703.

Sales Engineers; 40–45; experienced in the construction equipment industry, or qualified to train in the construction industry. Will serve as district representatives in given territories in the sales promotion work of construction equipment of manufacturer to contractors. Should have outstanding sales ability and be a good mixer. Locations: one in San Francisco for the Pacific Coast territory; one in Chicago to cover the Central-West territory; one in Cleveland to cover Mid-West territory; and one in New York to cover New York State and the New England territory. W-2743.

RECENT BOOKS

New books of interest to Civil Engineers donated by the publishers and filed in the Engineering Societies Library, or in the Socity's Reading Room, will be found listed here. The notes regarding the books are taken from the books themselves and are edited by members of the staff of the Society or of the Library. Those books which are in the Library may be borrowed by mail by Society members for a small handling charge.

The City, Its Growth, Its Decay, Its Future. By E. Saarinen. Reinhold Publishing Corp., New York, 1943. 380 pp., illus., diagrs., $9^{1}/_{2}$ × 6 in., cloth, $3.50.

A noted architect presents his views on city planning, in the form of an analytic study of the urban community. How this community during historic times was born, has grown, has aged and then decayed are described, and why. Remedies are considered. The subject is presented from the layman's viewpoint.

The Engineer's Manual of English. By W. O. Sypherd, A. M. Fountain, and S. Brown. Rev. ed. Scott, Foresman and Company, Chicago, Atlanta, Dallas, New York, 1943. 503 pp., diagrs., charts, tables, 8 × 5 in., cloth, $2.50.

Intended as a textbook in English composition for students and a reference book for engineers. The technic that underlies all good writing is presented first; then the writing of letters, reports, articles, bulletins, and specifications is discussed in detail, with numerous examples. The new edition has been thoroughly revised.

Metals and Alloys Data Book. By S. L. Hoyt. Reinhold Publishing Corp., New York, 1943. 334 pp., illus., diagrs., charts, tables, $10^{1}/_{2}$ × 7 in., cloth, $4.75.

Contains, in compact, usable form, carefully selected values for the physical and engineering properties of metals and alloys of commercial importance. The wrought, cast, and stainless steels, cast irons, heat-resistant and corrosion-resistant casting alloys, and non-ferrous alloys are covered in detail. The data are chiefly presented in tables, with brief comment.

Timber Economy No. 4 (Windows, etc., and Their Black-out). Great Britain. Ministry of Works, Directorate of Constructional Design. His Majesty's Stationery Office, London, 1943. 23 pp., diagrs., 13 × 8 in., paper, 1*s.* (obtainable from British Information Services, 30 Rockefeller Plaza, New York, $0.30).

Specific instructions on methods of blacking out windows and other openings are given, with attention to economy of timber and other materials. Detail drawings for both domestic and industrial buildings are given.

Planning 1943, Proceedings of the Annual Meeting held in New York City, May 17–19, 1943. American Society of Planning Officials, 1313 East 60th St., Chicago, Ill., 1943. 175 pp., charts, tables, $9^{1}/_{2}$ × 6 in., cloth, $2.00.

The proceedings of the meeting and the papers presented there are included. Among the topics discussed are the effect of the war on our cities, regional councils in metropolitan areas, national planning, urban redevelopment, and the planning problems of cities.

Proceedings of the Twenty-second Annual Meeting, National Research Council, Highway Research Board, held at Hotel Statler, St. Louis, Mo., December 1–4, 1942. Edited by R. W. Crum, Washington, D.C., 1943. 494 pp., illus., diagrs., charts, maps, tables, 10 × $6^{1}/_{2}$ in., cloth, $3.25.

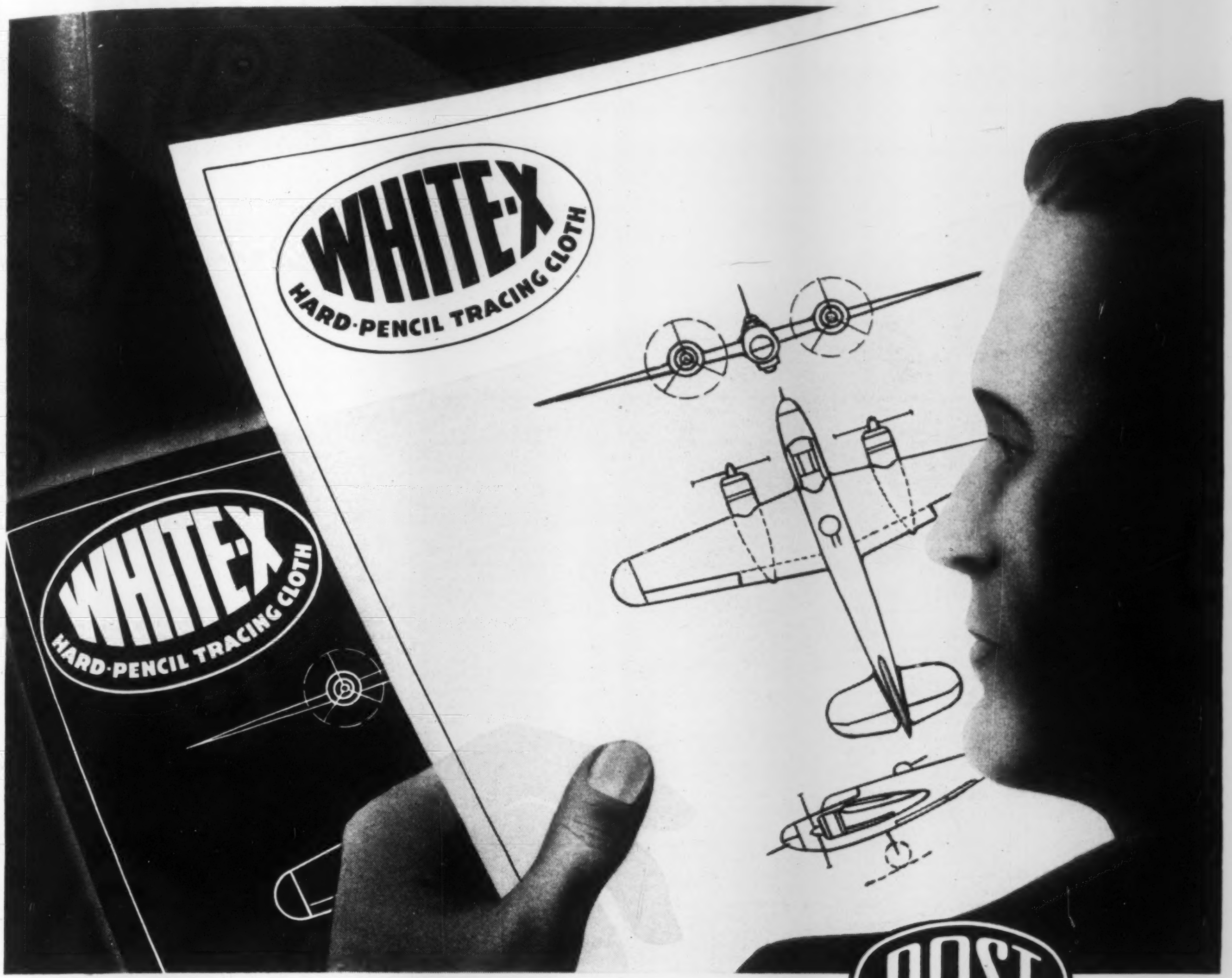
As in previous years, these proceedings present a valuable collection of results of research work on many problems of highway construction and maintenance. Questions of economics, design, materials, construction, maintenance, traffic, and soils are discussed.

Introduction to Fluid Mechanics, 2 ed. By A. H. Jameson. Longmans, Green & Co., London, New York, Toronto, 1942. 245 pp., diagrs., charts, tables, 9 × $5^{1}/_{2}$ in., cloth, $3.40.

Brief text prepared for use at the University of London, where an elementary knowledge of the subject is required of all engineering graduates. The aim has been to present the subject in a modern way and to illustrate it by diagrams, worked-out examples, and "guided" exercises and to avoid empirical formulas and tables of coefficients. New material on flow in pipes and notches, and over weirs is included.

Formulas for Stress and Strain, 2 ed. By R. J. Roark. McGraw-Hill Book Co., New York and London, 1943. 366 pp., diagrs. charts, tables, 9 × 6 in., cloth, $4.00.

Intended as a reference book for designers, this book offers a compact summary of the formulas, facts, and principles relating to strength of materials. Part I treats of definitions and symbols. Part II states general principles, describes methods of stress analysis and the behavior of material under stress. Part III, which occupies most of the book, discusses the behavior of structural elements under various conditions of loading, and gives extensive tables of formulas for the calculation of stress, strain, and strength. Bibliographies accompany the chapters. The new edition has been enlarged.



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CURRENT PERIODICAL LITERATURE

Abstracts of Articles on Civil Engineering Subjects from Publications (Except Those of the American Society of Civil Engineers) in this Country and Foreign Lands

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BRIDGES

Concrete, Prestressing. Some Examples of Reinforced Concrete Bridges Having Adjustable Prestressed Reinforcement, H. Lossier. *Great Britain Dept. Sci. & Indus. Research—Bldg. Science Abstracts*, vol. 16, no. 3, Mar. 1943, pp. 47–48. Design and constructional details given of some bridges in which is used auxiliary reinforcement (uncovered but protected from weathering influences) capable of being automatically prestressed, degree of prestressing being adjusted periodically according to requirements.

Design. Solution of Two-Span Continuous Beams Under Live Loads by Use of Nomographs, A. A. Jakkula. *Texas Agric. & Mech. College—Bul. (Fourth Series)*, vol. 12, no. 17, Dec. 1, 1941, 45 pp. Study extends solution of two-span continuous beam or girder to include effect of live load; this live load can be uniform live load covering either span or concentrated load at any point; it naturally follows that any combination of uniform loads that are full span in extent and concentrated loads of any magnitude and distribution can be handled by method of superposition.

Railroad Construction. Loops and Bridging Work on G. W. R. *Ry. Gaz.*, vol. 79, no. 1, July 2, 1943, pp. 17, 24. Some details of work effected by contractors on each side of section of main line. From *Great Western Ry. Mag.*, date not specified.

Steel Truss, Standards. Erection of Butterley Standard-Unit Bridge. *Engineering*, vol. 156, no. 4045, July 23, 1943, pp. 67–68, (illustrations) 70. Illustrated description of erection of Warren-truss type bridge built up of standard components bolted together on site, with total span of 270 ft; bridge has three spans; erection is merely matter of assembling standard parts, none of which is so heavy as to require heavy tackle.

Steel Truss, Tennessee. Ordnance Plant Bridge Built of Old Trusses, E. L. Durkee. *Eng. News-Rec.*, vol. 130, no. 24, June 17, 1943, pp. 901–903. By using nine remodeled railroad trusses, new river bridge has been erected for ordnance plant in Tennessee without requiring much new steel; simple and efficient system of dismantling and reerecting trusses resulted in speedy completion of structure.

Steel, Welding. Welding Evolution in Construction of Bridges and Steel Structures in Belgium, A. Spoliansky. *Welder*, vol. 12, no. 82, July–Dec. 1942, pp. 292–297. Paper was prepared and presented before present war and describes progress made in welding technique in Belgium since 1918; bridges and buildings which at time were many years ahead of contemporary welded structures of same type are described. (To be continued.) Before Inst. Welding.

Suspension, British Columbia. Building Peace River Suspension Bridge in Sub-Zero Weather, R. Archibald. *Pub. Works*, vol. 74, no. 8, Aug. 1943, pp. 24, 26. To carry Alaska Highway over Peace River, near Taylor Flats, B.C., Public Roads Administration built suspension bridge of 930-ft span in sub-zero weather, erecting towers entirely from ice in river; manner in which work was accomplished.

Wooden. Army Builds Creosoted Timber Bridges. *Pub. Works*, vol. 74, no. 6, June 1943, pp. 19, 60–61. Details of construction of 15 bridges built in development of large Southern army cantonment, using minimum of steel. From *Wood Preserving News*, date not specified.

BUILDINGS

Aluminum. Light Metals and Prefabrication of Buildings. *Light Metals*, vol. 6, nos. 66, 67, 68, July 1943, pp. 328–335, Aug., pp. 381–395, Sept., pp. 434–444. Outline of fundamental concept of prefabrication and its relationship to various raw materials; role of aluminum and aluminum alloys; gravity die casting and sand casting; comparison with other building materials in sheet form and in light of working and assembly systems and processes; "all-aluminum" house is criticized.

Concrete. National Emergency Specifications for Design of Reinforced Concrete Buildings. U.S. War Production Board, Washington, D.C., Govt. Printing Office, 1942, 38 pp. General requirements and working stresses; design; flexural computations; shear and diagonal tension; bond and anchorage; flat slabs; columns and walls; footings.

Concrete. Three-Pin Reinforced-Concrete Frame Buildings. *Engineering*, vol. 155, no. 4041, June 25, 1943, pp. 506–507. Illustrated description of system, basic principle of which is that of 3-pin portal frame in pre-cast reinforced concrete units; design is due to C. W. Glover and Partners; pair of units that form one complete span are jointed at apex by pin, and other two pins are formed by rounded ends of vertical legs of span; system can be used for buildings ranging from huts which can be erected by three men in 7 hours to elaborate multi-story buildings.

Hospitals, Military. Army Hospital Built of Concrete Blocks. *Eng. News-Rec.* (News Issue), vol. 130, no. 23, June 10, 1943, pp. 8–9. Mid-West army cantonment has semi-permanent hospital, for which cement blocks were used in constructing exterior walls of all buildings; plan for 1,500 beds at present and enlargement later to provide 1,700 beds; hospital includes 46 buildings, most of which are special structures; there are 6 barracks of similar layout, 8 standard wards, and 6 special wards; greater number of structures are two stories in height.

Postwar, California. Postwar Schools, J. L. Reid. *Architect & Engr.*, vol. 153, no. 2, May 1943, pp. 12–24 and 32. Pictorial presentation with descriptions of six schools recently constructed in California; effect of construction on well being of scholars and general curriculum, cafeterias and playgrounds.

Wooden. Two-Story Dormitories Built of Wood Frames and Large-Size Fiber-Board Panels to House Washington's "Government Girls." *Construction Methods*, vol. 25, no. 7, July 1943, pp. 58–59. Buildings are of wood-frame construction with outer walls of Cemesto fiber board; panels each 4 ft wide and up to 12 ft long, provide complete wall, including exterior and interior finish, plus insulation against heat and cold; units are composed of bagasse sealed with special asphaltic compounds.

CITY AND REGIONAL PLANNING

Boston, Mass. Report on Geodetic Survey for Boston—1935–1941. City Planning Board, Boston, Mass., Nov. 1942, 197 pp., maps, charts, tables, illus., Report pertains to engineering survey for purpose of making official map of City of Boston; only triangulation portion of control survey is described in present work.

Great Britain. Planning Land of Great Britain. *Nature* (London), vol. 151, no. 3840, June 5, 1943, pp. 623–625. Discussion of bill introduced in House of Commons by Minister of Town and Country Planning; under this bill, planning control is to be extended to all areas in England and Wales not already subject to control.

Housing, Postwar. Postwar City Planning and Rebuilding, J. L. Crane, Jr. *Architect & Engr.*, vol. 153, no. 2, May 1943, pp. 25–27. Recent estimates from various sources indicate national need for from 1,000,000 to 2,000,000 new and rebuilt houses per year for ten years following war; houses will be occupied largely by young men returning from war; place of housing in planned economy; labor and materials. Before Nat. Assn. Housing Officials.

London. London of Future. *Engineering*, vol. 156, nos. 4044 and 4045, July 16, 1943, pp. 51–52, July 23, pp. 71–72. July 16: Review of scheme prepared for London County Council by J. H. Forshaw and P. Abercrombie. It is proposed that there should be three ring roads: "A" road, innermost of three, would link main line railway termini; "B" road would be designed for fast traffic, especially for docks and railway freight yards; "C" road would pass round outskirts of London. July 23: Transportation in new scheme.

Long-Range. City's Role in Long-Range Planning and Programming, H. D. Fritz. *Highway Mag.*, vol. 34, July–Aug., 1943, pp. 92–94. Public works planning and programming procedure; analysis of community needs; listing of proposed projects; capital budget; engineering plans; municipalities plans.

Streets. Rues larges et mortes ou rues etroites et animess, J. Beguin. *Bul. Technique de la Suisse Romande*, vol. 68, no. 24, Nov. 28, 1942, pp. 284–286. Wide and dead streets vs. narrow and lively streets; author seeks to show that "good street" for commerce is not the wide straight avenue, a conception of the nineteenth century, but in most instances the relatively narrow and crooked streets of old cities.

Surveys Advisable. Survey in Town Planning, R. L. Stirling. *Surveyor* vol. 102, no. 2677, May 14, 1943, pp. 203–205. Postwar town planning should be undertaken only after comprehensive survey of existing conditions; notes on collection and presentation of data for such surveys which should include general and detailed maps of area; data on communications, industry, population, existing land use, health, housing, and public services.

Switzerland. La technique de l'elaboration d'un plan directeur, A. Bodmer. *Bul. Technique de la Suisse Romande*, vol. 68, no. 22, Oct. 31, 1942, pp. 253–259. City and regional planning; attention called to harmonious and rational planning of Middle Ages, Renaissance, and Baroque periods, and more haphazard planning in nineteenth century; new legislation for directive regional planning in Switzerland discussed.

CONCRETE

Airport Runways. Military Airport Paved with Concrete in Near-Zero Weather. *Construction Methods*, vol. 25, no. 6, June 1943, pp. 48–51, 138–139. Special cold-weather technique described which made it possible to mix and place concrete for paving runways at airport in Pacific Northwest in near zero temperature; paving procedure and water-heating methods described.

Airports, Great Britain. Bases for Bombing from Britain, W. G. Bowman. *Eng. News-Rec.*, vol. 131, no. 7, Aug. 12, 1943, pp. 252–259. U.S. Corps of Engineers is supervising construction of United States airbases in Great Britain; concrete being used for runways, taxiways, and hardstandings; hangars are of steel, pre-cast concrete, or brick; difficulties with soil are being encountered and soil stabilization program is being considered; modern American equipment in use.

Barges. Concrete Ship Construction, S. C. King and J. F. Barrett. *Western Construction News*, vol. 18, no. 6, June 1943, pp. 249–251. Twenty-six concrete barges to be used for coastwise transportation of dry cargo, freeing ships for other vital transportation needs; vessels have over-all length of 366 ft 4 in., beam 54 ft, and depth midship of 35 ft; their total displacement is 10,950 long tons with draft of 26 ft 3 in., and cargo capacity of about 6,300 tons.

Barges. Sea-Going Barges of Concrete Construction. *Eng. News-Rec.*, vol. 130, no. 24, June 17, 1943, pp. 878–883. Concrete barges of conventional shape of ship are being poured continuously almost to deck height in shipyard at Savannah, Ga.; lightweight aggregate with 9¼ bags of cement per cu yd makes 5,700 lb of con-

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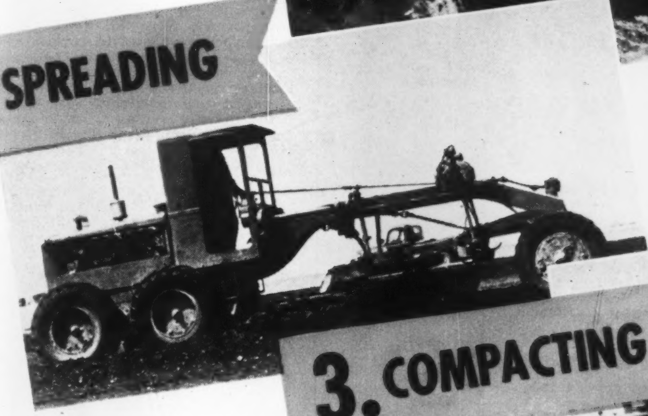
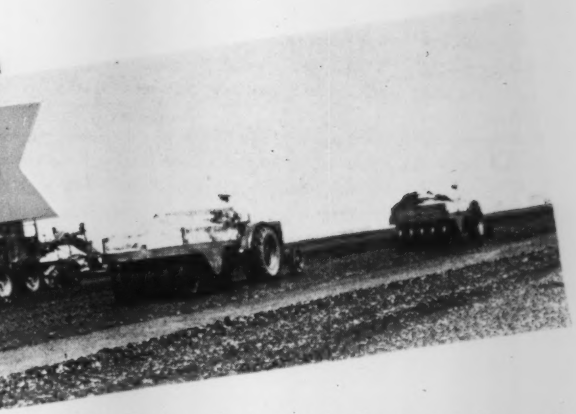


3. COMPACTING



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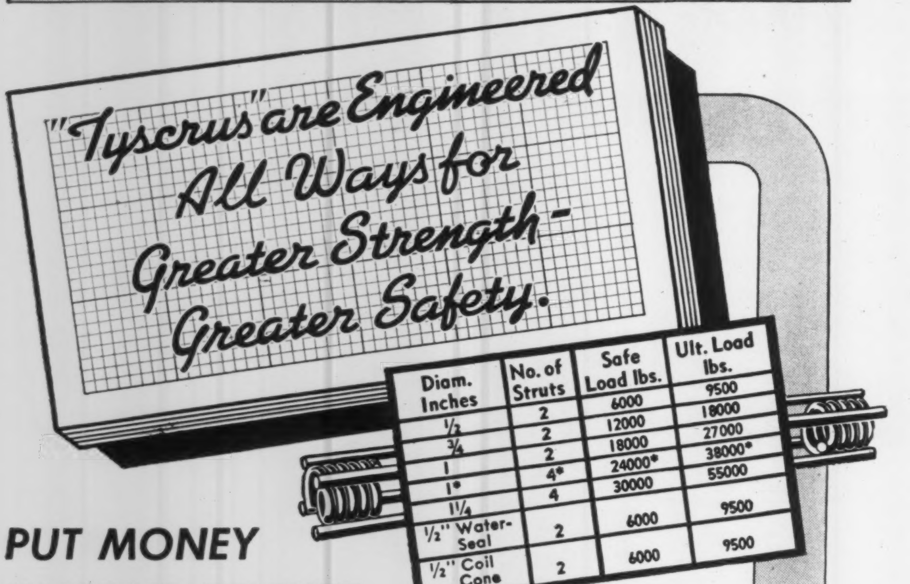
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crete weighing 108 lb per cu ft; longitudinal steel in bottom and deck, butt-welded continuous for full length of vessels, is pulled in through prow for placing; metal used is one-half weight of that in all-steel ship of comparable capacity.

CEMENT ADMIXTURES. Cement Dispersion, E. W. Scripture, Jr. *Pit & Quarry*, vol. 36, no. 2, Aug. 1943, p. 75. Recent researches have shown that certain complex organic compounds will disperse cement and will not have injurious effects; principle of dispersion has been widely applied in practical construction; savings in construction cost are, by this means, effected by greater ease of placing, by reduced finishing and patching required, by improved mix design, by greater speed in stripping forms and by shorter curing period required.

CEMENT ADMIXTURES. Effects of Addition of Calcium Chloride to Portland Cements and Concretes, A. J. Newman. *Concrete & Constr. Eng.*, vol. 38, no. 5, May 1943, pp. 159–167. Results of tests carried out at Building Research Station to investigate effects of calcium chloride additions on properties of portland cements and concretes; concreting at normal temperatures; concreting at low temperatures; materials and methods of testing.

COMPACTION. Practical Importance of Thorough Compaction of Concrete, H. Lenhard. *Great Britain Dept. Sci. & Indus. Research—Bldg. Science Abstracts*, vol. 16, no. 3, Mar. 1943, pp. 34–35. Examination of water cement ratio-strength relation of concrete as developed by Abrams and significance of workability of mix; account of author's experiments showing that all concrete mixes in which grading of aggregate is only variable, can be equally compacted provided that sufficient energy is used.

CONCRETE, QUEBEC. Million Yards Concrete for Dam. *Rock Products*, vol. 46, no. 6, June 1943, pp. 52–54. Illustrated notes on Shipshaw power development of Aluminum Company of Canada; when completed, capacity of project will be 1,500,000 hp; crushing, screening, and concrete-batching equipment shipped in by plane; five dams built to control flow of Saguenay River.

CONSTRUCTION, ACCIDENT PREVENTION. Prevention of Accidents on Concrete Construction, L. C. Hammond. *Concrete*, vol. 51, no. 1, Jan. 1943, pp. 33–35. Size and character of safety organization of methods used will depend upon nature of work and number of men employed; importance of regular inspections; erection and removal of wooden forms constitute principal source of accidents on concrete construction work; providing first aid; accident costs.

DESIGN. Some Important Aspects of Elastic Modulus of Concrete, R. H. Squire. *Structural Engr.*, vol. 21, no. 6, June 1943, pp. 211–239. In ordinary reinforced concrete practice there are two well-recognized methods of design—first assumes straight-line distribution and deals with working stresses, while second assumes parabolic distribution and is based on ultimate stresses; author found neither perfectly satisfactory and prefers third method based on hyperbolic stress distribution which is described. Bibliography.

FLOORS. How to Select Concrete Floor Treatment, C. S. Glickman. *Chem. Industries*, vol. 52, no. 6, June 1943, pp. 740–741. Suggestions for selecting proper protective treatment for concrete floors; suitable floor treatments embrace wide variety of preparations ranging from inorganic salt solutions to synthetically prepared alkyds; selection of proper type of product must therefore be governed by performance factors desired; some of more important of these factors are summarized.

GASOLINE TANKS. Concrete Fuel Tanks Now Lined with Synthetic Rubber. *Aero Digest*, vol. 42, no. 6, June 1943, pp. 266, 269. In effort to effect savings in use of steel, studies on use of reinforced concrete tanks for fuel-storage purposes were made; from these studies came what are termed prestressed concrete tanks, now being installed in Naval bases throughout continental United States; lining is thin sheet of synthetic rubber known as thiokol FA which protects gasoline from drop in octane rating, which would occur if fuel were exposed to alkalies present in concrete.

MIXING. Dollar Economies in Concrete Proportioning, R. F. Moss. *Eng. News-Rec.*, vol. 130, no. 24, June 17, 1943, pp. 906–908. Inadequate water control contributes more to uneconomical proportioning than any other single factor; both too little and too much water costs money; accurate water control enables specified strength to be produced with less cement or provides greater strength with same quantity of cement and improves durability; field precision control methods and equipment are available to give proper water control.

PRODUCTS, BLOCKS. Concrete Blocks for Sabotage Protection, G. W. Hoffmann. *Eng. News-Rec.* (News Issue), vol. 130, no. 25, June 24, 1943, pp. 918–920. Recent tests have shown concrete blocks to be ideal material for walls and enclosures for protection of transformers, switch yards, and other energy centers against sabotage by rifle fire and bomb shrapnel; block walls take place of more expensive and less durable sand-bag barriers.

PROPERTIES. Review of Properties of Concrete, R. Allin. *Civ. Eng.* (London), vol. 38, no. 443, May 1943, pp 98–101. Review of most important conclusions drawn from research on properties of concrete during past 20 years; notes on compressive strength, volume changes due to moisture, curing, temperature effects, creep and extensibility, workability, aggregates, and choice of mix. Bibliography.

RAILROAD MAINTENANCE OF WAY, GROUTING. Stabilizing Railway Track Base with Portland Cement Grout. *Concrete*, vol. 51, no. 8, Aug. 1943, pp. 2–3, 25. Application of pressure grouting to water pockets under railway track was probably initiated by Pennsylvania Railroad in 1936 and 1938; during 1941 and 1942, grouting methods adapted to routine track maintenance have been studied by at least four other railroads; methods and conditions have differed widely; causes of water pockets; benefits of cement grout; description of methods on railroad in Middle West.

READY-MIXED CONCRETE PLANTS, CALIFORNIA. Ready-Mixed Concrete Plays Its Part in Henry Kaiser's Wartime Ventures, W. E. Trauffer. *Pit & Quarry*, vol. 35, no. 12, June 1943, pp. 83–86. Supplementing earlier activities in supplying aggregates, the Henry J. Kaiser Company has entered the ready-mixed concrete field; description of plant at Oakland, Calif.; other temporary plants have also been operated in bay area and other parts of California.

READY-MIXED CONCRETE PLANTS, ILLINOIS. Two Batching Plants, 40 Truck-Mixers Supply Concrete for Huge War Plant. *Pit & Quarry*, vol. 35, no. 12, June 1943, pp. 87–88. Brief description of plants used for supplying 435,000 cu ft of concrete for Dodge Chicago Plant, division of Chrysler Corporation.

READY-MIXED CONCRETE PLANTS, MAINTENANCE AND REPAIR. Tips on Maintenance for Ready-Mix Operators—III and IV, A. A. Levison. *Pit & Quarry*, vol. 36, nos. 1 and 2, July 1943, pp. 139–143, Aug. pp. 78–80. Truck mixers; agitators; truck chassis; wear of blades; water valves; cost of maintenance; driveways into job; allow time for servicing equipment.

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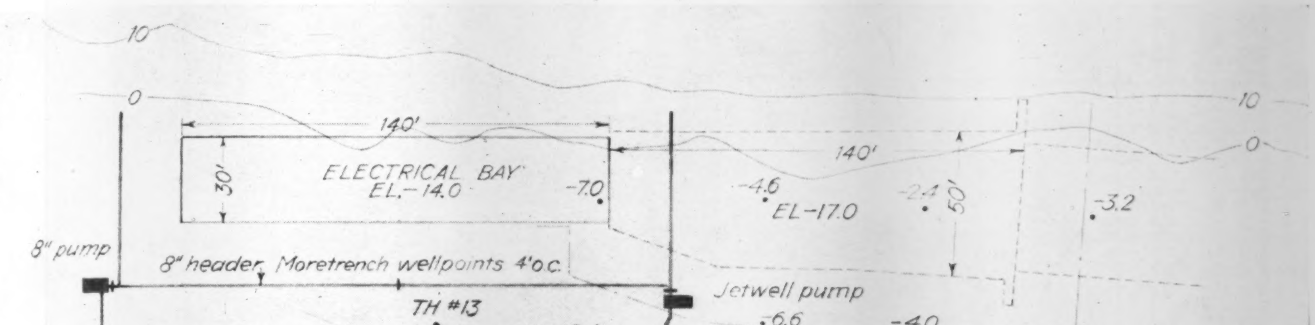
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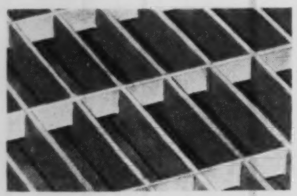

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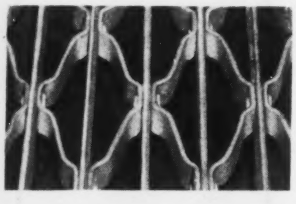

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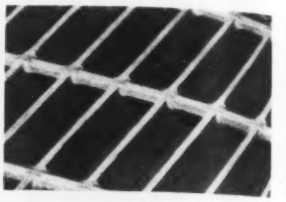

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RESERVOIRS. Many-Sided Reservoir Simplifies Formwork. *Eng. News-Rec.*, vol. 130, no. 24, June 17, 1943 pp. 904–905. In order to simplify formwork and thus speed construction, two 140-ft-diameter reinforced concrete water reservoirs for Mid-West plant were built not circular but with 46 sides each about 10 ft long; in addition to simplifying formwork, this type of construction permitted use of forms with few alterations for other purposes at later date.

ROADS AND STREETS. Maximum Service from Concrete. *Better Roads*, vol. 13, no. 8, Aug. 1943, pp. 24–27. Review of approved methods of cleaning and filling joints, patching, mud jacking to restore slab contour, and repairing spalled areas.

SHIPYARDS, BASINS. Ship Construction Basins of Thin Concrete. *Eng. News-Rec.*, vol. 131, no. 3, July 15, 1943, pp. 152–155. Basins for building concrete ships at Tampa, Fla., have thin concrete floors and walls; ground water in area is kept low by well points penetrating rock stratum and pumped as needed to prevent uplift of basins; construction of thin-wall sections of basins served as training course for placing concrete under conditions later encountered in building ships.

SILOS. Reinforced Concrete Grain Silo, O. Faber. *Concrete & Constr. Eng.*, vol. 38, no. 5, May 1943, pp. 147–155. Silo holds 3,400 quarters of wheat and is divided in plant into 15 separate cells—three rows one way and five other; each cell is 8 ft square and 44 ft 9 in. high, including 3 ft 3 in. of square pyramidal hopper bottom constructed in concrete; elevation and plan drawings given; constructional details discussed.

WATER TANKS AND TOWERS. Concentric-Ring Concrete Tank for Topeka. *Eng. News-Rec.*, vol. 131, no. 5, July 29, 1943, pp. 194–197. Illustrated description of structure at Topeka, Kans., containing 1,000,000-gal tank 120 ft above ground, supported on three concentric concrete rings inside fluted exterior wall, and second 1,000,000-gal tank in base of structure, below ground; walls were built with sliding forms, work platform on rising structure serving as supporting form for horizontal slabs for tank bottom or cover.

CONSTRUCTION INDUSTRY

PUBLIC WORKS, POSTWAR. Postwar Pattern, H. G. Cochrane. *Eng. J.*, vol. 26, no. 4, Apr. 1943, pp. 187–190. Three years after victory, assuming it comes in 1944, and with gross national production maintained at or near 7 billions, 1,350,000 Canadian workers will probably be needed for capital goods production; of this number, 900,000 should be engaged in constructing, supplying, and equipping public works, buildings, housing, roads, and like projects; author believes public works program totaling 3 billion dollars should be anticipated.

DAMS

ARGENTINA. Tiburcio Benegas Dam, Argentina. *Engineer*, vol. 176, no. 4564, July 2, 1943, p. 14. Brief illustrated description of dam rebuilt in form of barrage with sluice gates; it carries highway bridge across river; purpose is to divert waters of Tunuyan River into two irrigation canals.

BOMBING EFFECT. German Dams Attacked Successfully, J. D. Lewin. *Eng. News-Rec.*, vol. 130, no. 24, June 17, 1943, pp. 890–894. Study of photographs of Moehne and Eder dams in Germany following recent attack by units of Royal Air Force indicates that attack on each structure was highly successful and that most of stored water in both reservoirs was lost; loss of this water for power, industrial, and navigation uses appears to be more serious than possible injury due to floods in valley below.

MASONRY. Dry-Stone Dam. *Engineer*, vol. 175, no. 4562, June 18, 1943, pp. 491–492. Illustrated description of dam built to close 60-ft breach in Mill Lade (aqueduct), in County of Angus; it is dry stone "dike" or wall of undressed stone, faced with built-up wall of clay protected with ballast; compared to concrete wall, dry stone dam has certain advantages which are given.

SPILLWAYS, DESIGN. Design of Circular Spillway Modified to Cure Pulsating Discharge, J. W. Trahern. *Eng. News-Rec.*, vol. 131, no. 1, July 1, 1943, pp. 25–27. Air was entrapped, with destructive results, in vertical shaft wasteway at San Pablo Reservoir in California; changes in design, to prevent free fall of water in air, are expected to end trouble; expectation confirmed by tests on model of revised design.

TENNESSEE VALLEY AUTHORITY. Douglas Dam Constructed in 13 Months. *Eng. News-Rec.*, vol. 131, no. 3, July 15, 1943, pp. 134–138. Water problems added unexpected difficulty to fastest major dam construction schedule ever undertaken; plans, equipment, and key personnel were taken bodily from Tennessee Valley Authority's Cherokee project; despite water delays of weeks, dam was closed a few days ahead of its schedule, to add immediately 100,000 kw of power to low-water capacity of TVA's electric system.

FLOOD CONTROL

FLOODS, CALIFORNIA. Floods of March 1938 in Southern California, H. C. Troxell and others. *U.S. Geol. Survey—Water Supply Paper 844*, 1942, 399 pp., supp. plates, map in pocket, $1.25. General data of storm and flood; meteorologic and hydrologic conditions; basic discharge records; maximum inflow to reservoirs; basic studies of basic discharge records in relation to basin characteristics and rainfall; records of stage and discharge at stream-gaging stations; summary of flood discharges; physiographic and geologic features affecting flood runoff; flood damage.

WEST VIRGINIA. Pumping Station for Flood Protection. *Eng. News-Rec.*, vol. 130, no. 24, June 17, 1943, pp. 886–889. Pumping station contains 3 pumps capable of handling 627,000 gal per min; in substructure is reinforced concrete culvert with capacity of 18,000 cu ft per sec to take care of local runoff within Huntington, when Ohio is at low stage; gates and trash screens of culvert, which are located outside station, are raised and lowered by traveling crane inside station for servicing pumps and motors.

FLOW OF FLUIDS

WEIRS. Weir with Flow Proportional to Head, E. G. Smith. *Eng. News-Rec.*, vol. 131, no. 5, July 29, 1943, pp. 198–199. For float-regulated chemical dosing of sewage effluent, weir of inverted-notch type has proved very practical; use of weir for this purpose has shown that it should be of great value for many other uses, including application for maintaining constant velocities through tanks with large variations in flow.

FOUNDATIONS

CONSOLIDATION. Artificial Consolidation of Sub-Foundations, R. R. Minikin. *Civ. Eng.* (London), vol. 38, no. 444, June 1943, pp. 118–121. Methods of consolidating foundation soils by grouting and chemical consolidation; specific examples are given of work on bridge pier footings, dams, building foundations, and graving dock construction.

EXCAVATION. Hazards in Trench Excavation. *Pub. Works*, vol. 74, no. 8, Aug. 1943, pp. 38–39. Hazards of trench excavation, as compiled by National Safety Council (Data Sheet No. D–Con. 2) from many sources, and precautions that should be taken to avoid them.

INDUSTRIAL PLANTS. Deep Footings Built Without Forms, H. A. Saurbrey. *Eng. News-Rec.*, vol. 131, no. 3, July 15, 1943, pp. 142–143. Several hundred deep footings for factory were constructed in firm clay without formwork; clamshell bucket removed earth, but workmen, guided by timber template, shaped side-walls with hand spades; reinforcing steel was then set and concrete was placed directly against clay at large saving in cost.

PILE. Earth Pressures and Sheet Piling, S. Packshaw. *Dock & Harbour Authority*, vol. 24, nos. 271, 272, May 1943, pp. 12–15, June, pp. 42–44. Purpose of paper is to consider lateral earth pressures and to review application of sheet piling to various types of civil engineering work; classical earth pressure theories; tests on retaining walls; cohesive soils; earth pressure diagrams. Before Northern Ireland Assn. Instn. Civ. Engrs.

HYDRAULIC ENGINEERING

HYDRAULICS. Hydraulics Simplified. *Pub Works*, vol. 74, no. 6, June 1943, 15 pp. Condensed and simple statement of principles of hydraulics as applied to water-works problems, with examples of such application.

LAND RECLAMATION AND DRAINAGE

CULVERTS, DESIGN. Utilizing Siphon Principles in Culvert Design. *Pub. Works*, vol. 74, no. 6, June 1943, pp. 22–24, 54. Where true siphons can be used to advantage for culverts and how to design them; flared siphons believed by California engineers to be ideal solution for many drainage problems.

DRAINAGE SYSTEMS. Heavy-Duty Clay Tile Drains, V. O. McClurg. *Eng. News-Rec.*, vol. 131, no. 7, Aug. 12, 1943, p. 263. Site drainage during construction of Ohio ordnance plant, involved preservation of system of tile drains and installation of new drainage lines using extra-strength clay tile capable of supporting heavy grading equipment; clay drain tile were obtained by machining down internal casting dies used in making ordinary tile, increasing wall thickness, with only minor sacrifice in internal diameter; tile of 3,600-lb per lin ft crushing strength were produced.

GREAT BRITAIN. Problems of Land Drainage, E. Latham. *Engineering*, vol. 156, nos. 4043 and 4044, July 9, 1943, pp. 22–24, and July 16, pp. 44–45. Consideration of how matters were left, prior to outbreak of war, and of problems that are likely to present themselves in future in Great Britain.

ROADS AND STREETS. Progressive Drainage Program. *Better Roads*, vol. 13, no. 7, July 1943, pp. 11–13, 18. Drainage program carried

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MATERIALS TESTING

CONCRETE. Alkali-Aggregate Reactions on Concrete as Measured by Dynamic Modulus, H. L. Kennedy. *Pit & Quarry*, vol. 36, no. 1, July 1943, pp. 64–69. In this paper, "alkali" refers to Na_2O and K_2O present in Portland cement or Portland cement replacements; test procedure; change in dynamic modulus; cement replacements containing alkali; effect of adding silica gel to concrete; effect of adding triethanolamine with silica gel; effect of curing temperatures.

STRENGTH OF MATERIALS. Percentage Stress-Strain Diagram as Index to Comparative Behavior of Materials Under Load, H. J. Gilkey and G. Murphy. *Iowa State College—Eng. Experiment Station—Bul. 159*, vol. 41, no. 48, Apr. 28, 1943, 43 pp. Work constitutes effort to extend usefulness and significance of stress-strain diagram, and to make it instrument for broader understanding of processes of breakdown in engineering materials under static loading; percentage technique offers simple means for study and comparison of shape of stress-strain diagrams, both qualitatively and quantitatively.

PORTS AND MARITIME STRUCTURES

BREAKWATERS, CONSTRUCTION. Barge Places 90-Ton Breakwater Blocks, C. H. Cruttwell. *Eng. News-Rec.*, vol. 131, no. 3, July 15, 1943, pp. 149–151. Special barge to transport and place 90-ton concrete blocks, was designed for construction of 3,300-ft breakwater in Portugal; tipping car, operating on rails set below deck level, employed system of screw jacks to dump blocks over end of overhanging beam and into position in breakwater.

CAISSONS. Ship Caissons for Dock Entrances, S. C. Bailey. *Dock & Harbour Authority*, vol. 24, nos. 271, 272, May 1943, pp 19–23, June, pp. 39–41. Caisson decks and chambers; water tanks, pumps and ballast; weights of caissons; construction; floating out caissons; pressures on caisson and entrance walls; centers of gravity and buoyancy; stability of caisson; calculations for buoyancy and ballast; diversity of types of caissons.

SHORE PROTECTION. Reclaiming North Carolina "Banks," A. C. Stratton. *Shore & Beach*, vol. 11, no. 1, Apr. 1943, pp. 25–27, 32. Project described; sand fences and plantings used to rehabilitate barrier beaches in proposed Hatteras national seashore area.

PUBLIC WORKS ENGINEERING

POSTWAR. Postwar Public Works, W. Chevalier. *Water Works Eng.*, vol. 96, no. 14, July 14, 1943, pp. 786–789; see also *Water Works & Sewerage*, vol. 90, no. 7, July 1943, pp. 255–258. Financial outlook for immediate postwar period shows trend toward greater inflation unless construction work and consumer goods production can be undertaken quickly; program required for both public and private enterprise is outlined.

POSTWAR. Role of Public Works, W. T. Chevalier. *Crushed Stone J.*, vol. 18, no. 2, June 1943, pp. 3–8. Analysis of various programs for postwar construction, particularly with reference to highway construction; postwar planning should not be based on expectation of depression but on serious economic need for highway construction. Before Chamber of Commerce of United States.

ROADS AND STREETS

AIRPORT RUNWAYS, CONCRETE. Concrete Paving in Low Temperatures. *Engineering*, vol. 156, no. 4042, July 2, 1943, pp. 16–17. Account of construction of runways at airport in the United States at day temperatures as low as 7 F, and night temperatures at 9 F below zero; aggregate plants and storage bins were enclosed, mixing water was heated in two tanks of 1,800 and 2,500-gal capacity, respectively; protection of subgrade before laying pavement appears to have been most difficult operation; hay or straw used to insulate pavement against cold.

AIRPORT RUNWAYS, SOIL CEMENT. Build Landing Mat a Half-Mile Square of Soil-Cement Construction. *Concrete*, vol. 51, no. 3, Mar. 1943, pp. 4–6, 35. Notes on construction of landing mat 2,500 ft square for training planes of U.S. Navy, somewhere in Indiana; compare similar description in paper previously indexed from *Roads & Streets*, Feb. 1943.

ASPHALT. Flexible Pavement Reaction Under Field Load Bearing Tests, P. Hubbard. *Asphalt Inst.—Research Series No. 9*, May 5, 1943, 11 pp. Purpose of article is to describe new approach to problem, which it is believed will correct existing faults to considerable extent in field load-bearing tests and will make possible truer evaluation of actual load-carrying capacity of given design, and relative load-carrying capacity of different designs; key to this situation would seem to lie in recognition and isolation of factor which may be termed initial settlement under concentrated loading.

BITUMINOUS. Conservation Keynote in Bituminous Maintenance. *Better Roads*, vol. 13, no. 6, June 1943, pp. 23–28. Operations being stressed in maintenance of bituminous roads under wartime conditions; traffic and severe spring back-up have compounded problems; maintenance practices of various states cited.

CAMOUFLAGE. Highways and Bombardier, M. E. Trotter, Jr. *Ohio State Univ.—Eng. Experiment Station News*, vol. 15, no. 3, June 1943, pp. 23–25. Fundamentals for successful camouflaging of highways with particular attention to Ohio systems.

CONCRETE, CALCUTTA. Concrete Road Construction by Calcutta Improvement Trust, W. H. Prosser. *Indian Concrete J.*, vol. 17, no. 2, Feb. 1943, pp. 14–18. Main factors in design for concrete highway are road base and road slab itself; importance of study of soil conditions; characteristics of subsoil of city of Calcutta and suburbs; influence of subsoil water; roads to have final surface of concrete are constructed initially as water-bound macadam roads; design features of C. I. T. roads; steel reinforcement of concrete slab; illustrations of examples of completed roads.

CONCRETE, MEXICO. Pavimentos de Concreto Reforzado en la Ciudad de Mexico, F. Barona de la O, A. Rosales Maso and J. Contreras Torres. *IV Congreso Panamericano de Carreteras—Memoria*, vol. 2, 1942, pp. 115–129. Reinforced concrete pavements in Mexico City; on streets and avenues where traffic is heavy, more than 1,000,000 sq m of concrete pavements have been constructed; due to increase in cost of material and labor, work has been practically abandoned; new type of concrete pavement, efficient but of lower cost, is suggested.

CONSTRUCTION. Using Power Patrols in Tandem for Heavy Grading, D. R. Savage. *Pub. Works*, vol. 74, no. 6, June 1943, pp. 13, 57. With only two patrols and two trucks available, Aitkin County, Minn., converted flat, muddy or snow-drifted roads to raised 24-ft surfaces with adequate side ditches.

HIGHWAY SYSTEMS, ALASKA. Alcan Highway, J. Reichart. *Mines Mag.*, vol. 33, no. 7, July 1943, pp. 363–364, 374. Illustrated descriptive notes on construction, with special reference to use of well-known diesel tracklaying tractor equipment.

HIGHWAY SYSTEMS, ALASKA. Building Alcan—America's Glory Road, H. W. Richardson. *Compressed Air Mag.*, vol. 48, no. 6, June 1943, pp. 7047–7054. For more complete account, see series by same author, as indexed in *Engineering Index*, 1942.

HIGHWAY SYSTEMS, CALIFORNIA. California Highway System Meeting Extraordinary Demands in Volume and Tonnage of Wartime Truck Traffic. *Calif. Highways & Pub. Works*, vol. 21, nos. 7 and 8, July–Aug. 1943, pp. 1–5, 18. Part played by California's highways in war effort; statistical data pertaining to movement of truck traffic over these roads; few specific examples cited; rubber-borne traffic; freight for war needs; truck and trailer hauls.

HIGHWAY SYSTEMS, POSTWAR. Postwar Highway Program, C. M. Upham and D. R. Lamson. *Highway Mag.*, vol. 34, July–Aug. 1943, pp. 87–91. Article summarizes highlights of study of effects of highway construction on national economy, with relation to employment and prosperity in postwar period.

HIGHWAY SYSTEMS, TEXAS. OSR—Historic Texas Route, J. M. Owens. *Better Roads*, vol. 13, no. 8, Aug. 1943, pp. 15–17, 29. Old San Antonio Road follows travel route more than 200 years old; section in Bastrop, Caldwell and Hays counties, built as access road under wartime conditions, will be finished this fall; constructional details.

INDIA. Value of Roads to India Both During and After War, C. E. Aitken. *Indian Concrete J.*, vol. 17, no. 2, Feb. 1943, p. 43. Brief general commentary on importance of roads in country not adequately served by railway lines and inland water routes; in spite of probable industrial development, India will remain predominantly an agricultural country; feeder roads, connecting villages with towns, marketing centers, and railway stations, will be of utmost value; far-reaching road-development programs have been prepared.

INDIA. War and Roads in Punjab, R. T. Jones. *Indian Concrete J.*, vol. 17, no. 2, Feb. 1943, pp. 33–37. Early roads in Punjab were well planned and bridged; after lapse, automobile brought revival of road building; problem of river crossings; reconstruction and improvement needed, with by-passes around towns and facilities for fast and slow vehicles; advantages of concrete roads; majority of Punjab roads are surfaced with tar; maintenance cost is high; use of "creteways" or trackway strips; Punjab "Kacha" unmetalled roads; great need is for low-cost local material for improvement.

INTERSECTIONS. Highway Grade Separation Structures on Road Network Serving Pentagon. *Wood Preserving News*, vol. 21, no. 6, June 1943, pp. 60–62, 69–70. Use of creosoted wood piling in construction of by-passes serving highway approaches to Pentagon Building of War Department at Washington.

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Now it's a "bridge of ships" instead of sturdy, low-cost drainage structures. The metal in Armco Multi Plate that serves so dependably under highways and railways now can be supplied only for vital war construction.

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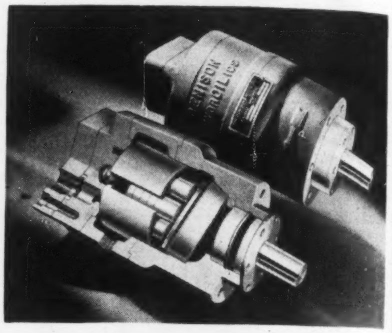
Equipment and Materials

Fluid Motors

A NEW FLUID MOTOR with "the floating drive" is announced by The Denison Engineering Co., Columbus 16, Ohio, and fully described in their Bulletin FM-200.

The manufacturers state that the Denison HydrOILic Fluid Motor is built to meet industry's need for a fluid motor capable of withstanding constant shock loads; that it delivers rotating power in either direction, at a great number of speeds within its operating range; that it can be abruptly stopped, started or reversed, operated intermittently or continuously, and stalled repeatedly, without damage to working parts.



Features claimed for the Denison HydrOILic Fluid Motor are: An axial-piston-type fluid motor; stepless speed variation; high efficiency; adaptability to any mounted position; shock protection; ability to start immediately upon application of the oil pressure; a minimum number of moving parts; complete self-lubrication; long-life service; and easy reconditioning.

Tests Toughness of Wood

A NEW MACHINE FOR TESTING the toughness of wood, recently developed by the U.S. Forest Products Laboratory, is being manufactured by the Baldwin-Southwark division of The Baldwin Locomotive Works, Philadelphia, Penna.

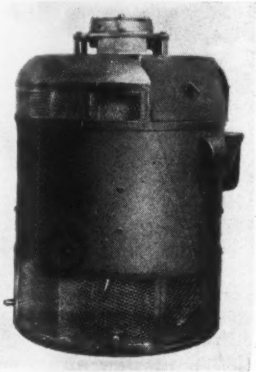
The machine, known as the F. P. L. Toughness Testing Machine, discloses possible physical weakness in wood more accurately than by density and other physical property tests usually made in inspection for exacting uses of wood. The toughness testing machine operates by a falling pendulum which breaks a wood specimen supported as a simple beam loaded in the middle. The machine has fifteen different loading capacities and three speeds to rupture the specimen of wood being tested. Indications of the machine are converted into the number of inch-pounds of energy which are absorbed in breaking the specimen. The machine must be used in conjunction with visual inspection to eliminate compression wood as well as diagonal and spiral grain, the manufacturer states. Compression defects resulting from proud wood and decay, which might not be discovered by the usual inspection methods, can be revealed by the machine.

Toughness in wood is dependent upon the relation of tensile to compressive strength, according to L. J. Markwardt, chief of the timber mechanics section, U.S. Forest Products Laboratory. "When tensile strength is high for a given density the compressive strength is low," Mr. Markwardt said, "and when tensile strength is low, compressive strength is high. Small changes in the ratio of tensile to compressive strength are accompanied by substantial changes in toughness. Incipient decay influences toughness before its effect is indicated by density."

New D-C Vertical Motors

A new line of direct-current vertical motors ranging from 40 to 200 hp at 1,750 rpm, and in equivalent ratings at other speeds, has been announced by the General Electric Co., Schenectady, N.Y. The new motors, which are furnished for both constant and adjustable speeds, are designed for low-thrust, solid-shaft applications on pumps, machine tools, and marine underdeck auxiliaries. They are also desirable in cases where valuable floor space must be saved or the expense of gearing avoided.

The motors are of drip-proof, protected construction, providing complete protection from dripping liquids and falling objects. Convenient fittings on both the upper and lower bearings simplify lubrication, and provision for the escape of excessive grease reduces the possibility of over-lubrication. A special bearing housing prevents grease from entering the motor and damaging the commutator and the windings.



The cast-iron conduit box is roomy and can be arranged for bringing the leads in at the top, bottom, or either side. Two hand-hole covers, removable without the use of tools, permit quick and easy inspection of the commutator and brushes. The ring-type base has an accurately machined rabbet and jig-drilled mounting holes, thus assuring permanent alignment with the driven machine. Sturdy lifting lugs facilitate installation.

Piping—Fabricated piping, to convey gas, air, steam, oil, and chemicals, or for construction purposes, is covered in an interestingly illustrated book issued by the Flori Pipe Company of St. Louis, Mo. It covers the various ways in which piping can be used and lists present market prices for every conceivable kind and size of fabricated piping.

Plants Get Into Production Fast When They Build With WOOD

HOT ON THE HEELS of the men laying these Wolmanized Lumber* planks come the roofers. This mill building gets under cover in a hurry, the machinery is placed, and it's soon in production. Again, building with wood has speeded the output of vital war products—a story that's been repeated hundreds of times all over the country.

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VACUUM-PRESSURE impregnation of ordinary wood with Wolman Salts* preservative produces long-lived Wolmanized Lumber. "Fibre fixation" prevents leaching-out of the preservative. All of the usual advantages of working with wood are retained; low cost, ease of handling and erection, light weight, paintability.

WOLMANIZED LUMBER is used for lightweight or heavy timber construction. It has the high strength needed for long spans. Its use is releasing scarce materials for manufacturing materials of war. Consider how it can serve in your postwar construction. American Lumber & Treating Company, 1649 McCormick Building, Chicago, Illinois.

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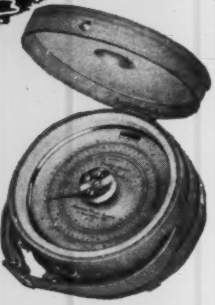

Preliminary surveys for highway construction, drainage and irrigation systems, dams, water lines, all divisions of civil engineering are speeded up by the *NEW* Paulin Precision Surveying Aneroid. Readings to two feet over a range of 4500 feet are as easy as reading a watch. Other models cover a range of 18,000 feet. Write for complete literature and FREE COPY of the *Paulin Altimetry Manual.*

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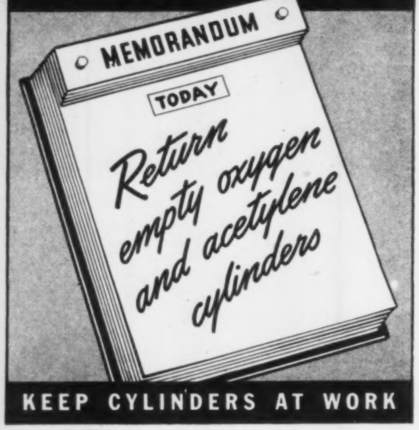
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Inspection Car

SINCE ITS INTRODUCTION LAST YEAR, a number of improvements have been made in the "Roadmaster," railroad inspection car manufactured by The Buda Co., Harvey, Ill. These are described and illustrated in Bulletin No. 1145.

A larger, roomier car of heavy-duty design, the new "Roadmaster" is equipped with special spring mounted pedestal bearings and deep, well-cushioned seats that absorb road shock. These features reduce physical and mental fatigue. Other details are: Capacity for from two to four passengers; air-cooled engine; all-steel rain skids; self-aligning four-wheel brakes; pressed steel wheels; positive chain drive; all-steel construction; sliding lift handles; protective windshield; easy accessibility to any part of the engine.

Lubricating Oil

DEVELOPMENT OF A NEW DETERGENT TYPE lubricating oil which is said to reduce wear and assure engine cleanness and oil stability for low-speed Diesel engines is announced by Standard Oil Company of Indiana.

Many engines give clean operation with conventional oils, but where dirty operation cannot be corrected by mechanical adjustment, this oil can be used, according to the company's engineers, to prevent ring-sticking, piston scuffing and excessive sludge and gum deposits. The detergency results from the use of an additive which is both a detergent and an oxidization inhibitor.

When a lubricant without detergency is used, carbon and other products of oxidation, as well as dirt, stick to each other and to engine parts. They deposit in rings and on valves and clog filters. With the new detergent type lubricating oil for low speed Diesels, however, it is claimed that a film coats the carbon and dirt, prevents particles from sticking, and holds them in suspension until they are trapped by a filter or drained from the engine.

Pocket-size Pipe Gage

A NEW POCKET-SIZE, Three-Point Pipe Gage, for instantaneous measurement of all sizes of pipe from $^1/_8$ to 12 in., is announced by the Three-Point Pipe Gage Co., 3821 Broadway, Chicago, Ill.

The gage consists of two pivoted steel plates with edges curved at three points for contact with the pipe to be measured, together with scale which automatically registers the inside diameter of the pipe, as well as the drill size for tapping. It is maintained by the manufacturer that the gage measures by the simple method of determining the outside arc of the pipe at three points of contact.

Advantages claimed for this gage are that it can take measurements from a small section of the pipe contour, that it will measure pipe in any position, and that it can be applied in dark places and taken to the light for reading. The gage is constructed of steel with deeply etched numerals and its size when closed is only $2^1/_2$ in. by $4^1/_4$ in.

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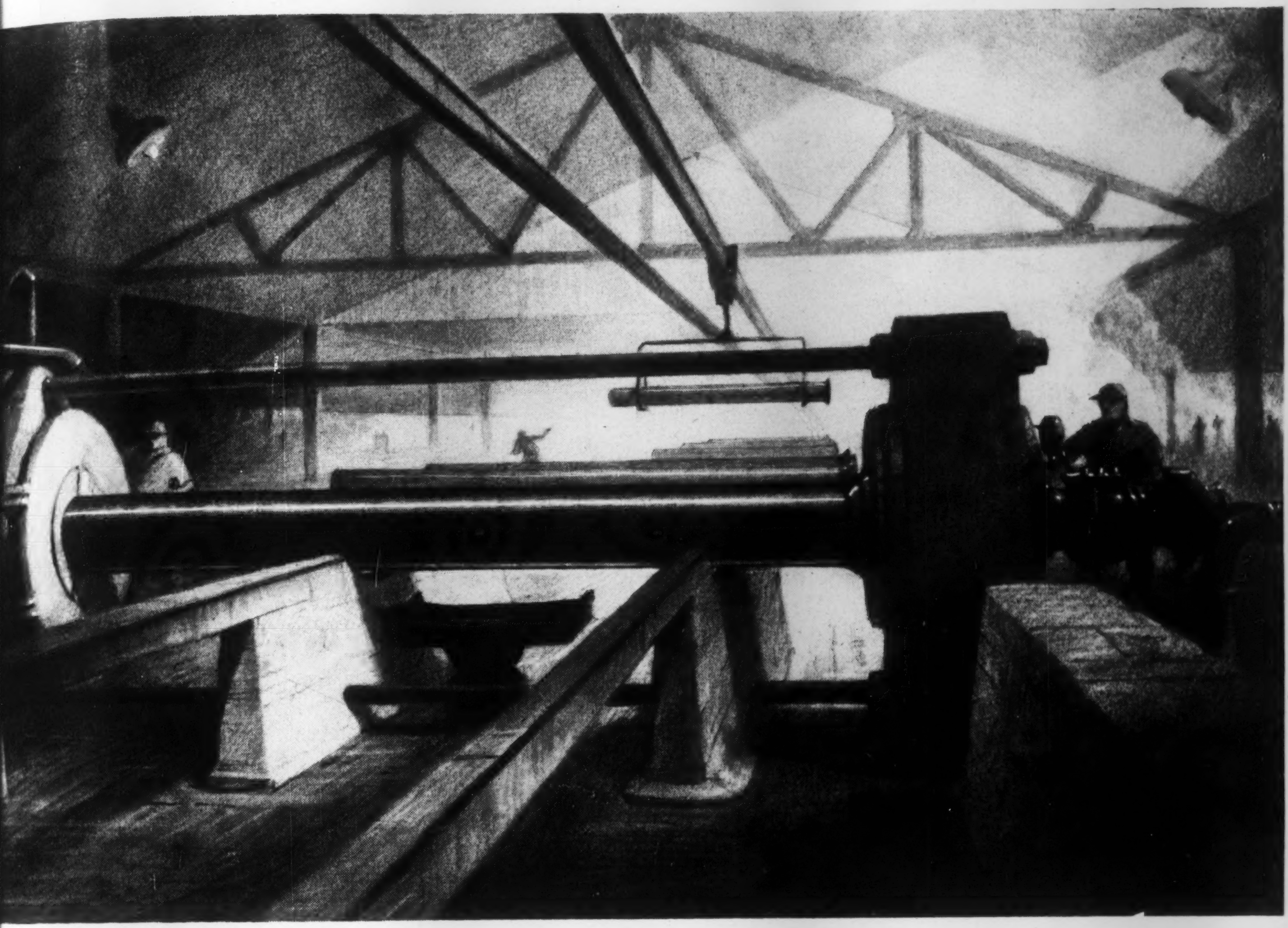

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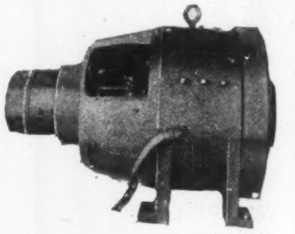
Revolving Armature Type A-C Generator

A 25-KW GENERATOR has been added t the line of products manufactured by the Kato Engineering Company, Mankato, Minn.

This new Model 55 Katolight generator has a rated capacity of 25 kw at 80% power factor, single phase, or 30 kw at 80% power factor, three phase. This unit is $38^{17}/_{32}$ in. long by $24^{1}/_{2}$ in. wide by $25^{1}/_{4}$



in. high and weighs approximately 1,375 lb. It is a revolving armature type, separately excited, six pole, 1,200 rpm with damper windings. It is available in all standard and special voltages, either straight 110, 220 or 440 volts single phase or 115/230 or 220/440, four ring single phase. Also available for straight 110, 220 or 440, three wire, three phase or 120/208 four wire, three phase. Inherent voltage regulation, approximately 10% between no load and full load with 3% speed change.

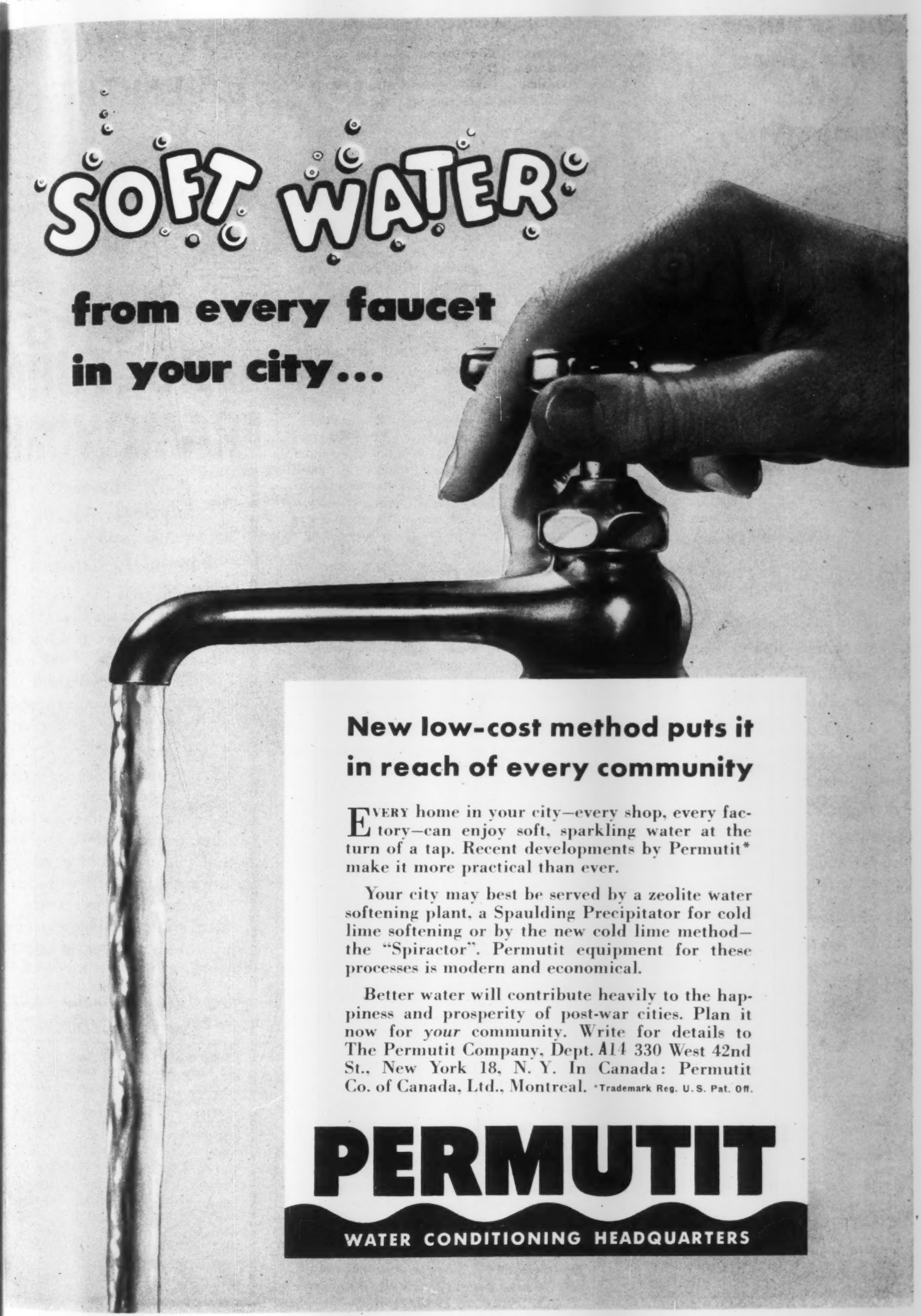
Details on the 25 kw, as well as other a-c and d-c generators will be supplied upon request by the manufacturer.

New Hard Hat

TO PROVIDE HEAD PROTECTION, the Davis Equipment Company, Halleck St., Newark 4, N.J., offers to industry a new hard hat under the tradename, "Hedgard."

For "Hedgard," the company claims the following elements of protection: A blow is first absorbed on the crown, which has a "give and deflect action"; it is further

absorbed in the new cradle and sweat-band construction; the hat will stand better than eight lb dropped ten ft, which is twice the standard drop-test. The material of which the Hedgard is composed is not brittle and will not shatter; the weight is slightly more than thirteen oz depending upon the type of sweatband used. The sweatband is removable and may be washed in water or dry-cleaned; the whole Hedgard may be sterilized with steam. Further information will be sent on request to the company.



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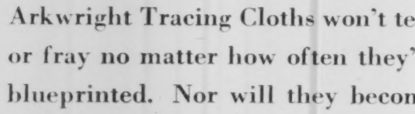

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BUILDINGS—Stran-Steel, Division of Great Lakes Steel Corporation, has just compiled a simple, graphically illustrated booklet which covers the huts and utility buildings it is building for the military forces. Today, Stran-Steel supplies a complete building package to meet military requirements for either the tropics or the snow-bound north. The erection of these buildings is a speedy, simple job, requiring only screwdrivers, wrenches, and hammers.

HYDRANTS—A new folder, Bulletin 62, describing the Kennedy Fire Hydrant has just been published. Sectional views show the construction of the entire hydrant, with an enlarged illustration of the Safety Breakable Section, which can be replaced within half an hour. A complete parts list and dimensions are also included, The Kennedy Valve Mfg. Co., Elmira, New York.

PIPE FITTING AID—A new 12-page booklet, "Pipe Templates for Welded Fittings," tells how to fabricate fittings for welded piping installations by means of flame-cutting and welding. This illustrated booklet published by the Air Reduction Company shows how to draw up and use paper templates for flame-cutting pipe to assure accurate, close-fitting connections.

The templates and procedures described in this booklet are intended primarily for use where special fittings are required or where stock welding fittings may not be available when needed. In such cases the methods outlined in this booklet will save guesswork and spoilage and will help assure efficient fabrication. Copies from Mr. G. Van Alstyne, Air Reduction, 60 E. 42nd St., New York 17, N.Y.

PRINT-MAKING—A new handbook of print-making and processing, covering the use of blueprints, direct process prints, sepia prints, and reproduced tracings and listing the advantages of each has been issued by the Paragon-Revolute Corp., 77 South Ave., Rochester 4, N.Y. Announcement is also made in the handbook of the new Revolute 8Q Printer for prints and sepia up to 54 in. wide.

PROTECTIVE COATING—A 12-page data bulletin summarizes the unusual properties of Ucilon, which produces tough, flexible coatings that are resistant to organic and inorganic acids, alkalies, salts, alcohol, gasoline, oils, greases, and moisture; also has excellent dielectric strength and can be readily applied to wood, metal, concrete, and other surfaces by brushing, spraying, or dipping. United Chromium, Inc., 51 E. 42nd St., New York 17, N.Y.

SHOVEL—A new 24-page bulletin takes the Buckeye Clipper Shovel apart, page by page, and holds each major part up for minute inspection. The many advantages of "Mevac" vacuum power control are explained and the vacuum power control features, such as the automatic swing brake and vacuum power dipper trip, are described in detail. Clipper Convertible Shovels, Cranes, Trench Hoes, Draglines and Piledrivers on war and prewar jobs are pictured. Complete up-to-the-minute specifications are included. Buckeye Traction Ditcher Co., Findlay, Ohio.

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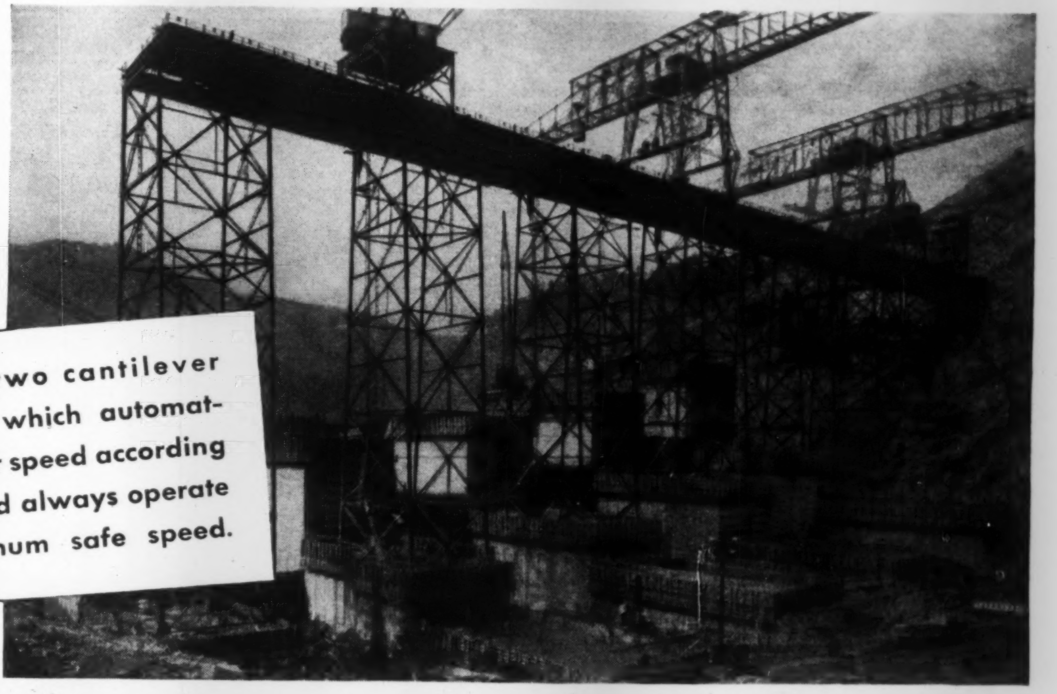
Two Cantilever Cranes That WEIGH THE LOADS They Lift



The story of two cantilever gantry cranes which automatically vary their speed according to the load, and always operate at the maximum safe speed.

By

M. A. WHITING

Industrial Engineering Division, General Electric Company

A NEW type of electric equipment on two large cantilever gantry cranes fulfills the need of a dam builder for equipment which enables him to pour concrete safely at a faster rate than ever before.

These cranes are furnished with 3-phase a-c power supply. They have a 300-foot "wingspread," operate along the top of a trestle 250 feet high, and can handle 4-yard buckets of concrete as readily as you can handle a pail.

The secret of their speed and accuracy lies in their unique hoisting equipment, which in effect weighs each load. The "brains" of this weighing operation is a development called the cross-flux exciter—about the size of a bushel basket. This device measures the load on the crane continuously and automatically, and controls the hoisting and lowering speeds accordingly, operating on the a-c power supply. *The lighter the load, the higher the speed; the heavier the load, the lower the speed—both hoisting and lowering.* This feat has heretofore been considered impossible except by the use of a complicated battery of sensitive load-responsive relays.

When the crane picks up a bucketful of concrete, the operator does not need to worry about safe operating speeds. The crane assumes that responsibility. After the load of concrete has been lowered into position and dumped, the operator returns the empty bucket to the starting point at speeds up to twice as high as those used in handling the full bucket. The cross-flux exciter "feels" the change of load, and controls the speed accordingly.

In case the bucket jams and refuses to budge, the electrical "brain" permits the crane to pull just so hard and no harder. That is to protect against picking up a load too heavy for the crane, which might overturn when the load is trolleyed out to the end of one of the arms.

The trolley operation is also unusual in that the customary relays and protective devices are dispensed with. Instead, a small motor the size of that on a washing machine irons out the accelerating peaks, assuring a smooth rate of change of speed under all conditions. This is a valuable asset in limiting the swing of the heavy bucket while trolleying.

This is another example of the application of new techniques to solve a construction problem created by today's needs. If you have a difficult problem where the experience and skill of G-E engineers can be of help, we should like to work with you. General Electric Company, Schenectady, New York.

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GENERAL ELECTRIC

655-34-162

Class, U.S. Army, 135 Hudson St., Boston, Mass.

Kipper, Howard Le Vasseur (Assoc. M. '43), Surv., Continental Oil Co., Drawer 1267, Ponca City, Okla.

Kral, George Joe (Jun. '43), Stress Analyst, Curtiss-Wright Corp., Robertson (Res., 2840 Walton Rd., Overland), Mo.

Legler, Fred Davis (Jun. '43), 2d Lt., Field Artillery, U.S. Army, Box 416, Craig, Colo.

Leimbach, Herbert John, Jr. (Jun. '43), Ensign, U.S.N.R., Glen Mary Lane, Radnor, Pa.

Lennington, Lee Roy, Jr. (Jun. '43), Junior Engr., Phillips Petroleum Co., Phillips, Tex.

Libby, James Walter (Jun. '43), Ensign, U.S.N.R., 1130 Hill St., Ann Arbor, Mich.

Lien, Harold Louis (M. '43), Engr., Survey and Plans, State Highway Dept., 329 South Kirkwood Rd. (Res., 514 East Adams Ave.), Kirkwood 22, Mo.

Lowrey, Joseph James (Jun. '43), Junior Engr., Phillips Petroleum Co., Alamo Refinery, Phillips, Tex.

Luck, Leon Dan (Jun. '43), Ensign, A-V (S), U.S.N.R., 3114 West Gordon Ave., Spokane, Wash.

Luther Robert Willard (Assoc. M. '43), Plant Supt. and City Engr., Public Utility Comm., Box 56, Elizabeth City, N.C.

McCoid Joseph Melvin (Assoc. M. '43), Lt., Air Force, U.S. Army, 149 Littleton St., West Lafayette, Ind.

McCutchan, James William (Jun. '43), 1846 Tenth Ave., Oakland, Calif.

McKinney, Daniel George (Jun. '43), Ensign, CEC, U.S.N.R., 6325 Via Colinita Drive, San Pedro, Calif.

Malcolm, Charles Buck, Jr. (Jun. '43), Engr., Rust Eng. Co. (Res., 414 London St.), Portsmouth, Va.

Maring, John Elmer (Assoc. M. '43), Commr., Streets and Sewers, City Hall (Res., 5330 Brooklyn), Kansas City, Mo.

Maynard, Stuart Barton (Assoc. M. '43), 2d Asst. Engr., Filter Design, Bureau of Water, 240 Chestnut St. Pier (Res., Franklin Park, Apt. 5 A, Chew and Duval Sts.), Philadelphia 38, Pa.

Merenbach, Simon (M. '43), Res. Engr., U.S. Engr. Office, 120 Wall St. (Res., 230 Riverside Drive), New York 25, N.Y.

Merrill, Bergen S., Jr. (Jun. '43), Midshipman, U.S.N., 1454 Bancroft Hall, U.S. Naval Academy, Annapolis, Md.

Moore, Albert Melville (Jun. '43), Asst. Engr., U.S. Geological Survey, 939 Post Office Bldg., Boston (Res., 31 Dennison Ave., Framingham), Mass.

Mulholland, Royce Artice (Assoc. M. '43), Engr., Bureau of San. Eng., State Dept. of Health, Austin, Tex.

Murray, David Oliver (Assoc. M. '43), Civ. Engr., U.S. Army, Grace Bldg., York St., Sydney (Res., 54 Sydney St., Willoughby, N.S.W.), Australia.

Mussetter, William (M. '43), 2d Lt., Coast Artillery Corps, U.S. Army, Coast Artillery School, Fort Monroe, Va.

Nasburg, Edwin (Jun. '43), Junior Hydr., Engr., Water Resources Branch, U.S. Geological Survey (Res., 1001 North Yakima Ave.), Tacoma, Wash.

Panagos, Peter (Jun. '43), 3 Palmer Sq., Princeton, N.J.

Parker, Stafford Hobbs (Assoc. M. '43), Structural Engr., United Engrs. & Constructors, Inc., 1401 Arch St., Philadelphia (Res., 207 Edgely Ave., Glenside), Pa.

Parrish, Dudley Tucker (Assoc. M. '43), Chf. Constr. Engr., J. A. Jones Constr. Co., Inc., Box 299, Knoxville, Tenn.

Parry Kenneth James (Jun. '43), Drafting Designer, Eng. Dept., The Lionel Corp., 28 Sager Pl., Irvington (Res., 78 Second St., South Orange), N.J.

Parsons, Donald Clark (Jun. '43), 2d Lt., Corps of Engrs. U.S. Army, Company A, S.O.T.R., Fort Belvoir, Va.

Pope, Robert Millard (Jun. '43), Corporal Technician, Corps of Engrs., U.S. Army, 777th Eng. Petroleum Distrib. Co., Camp Claiborne, La.

Powers, Cecil Herman (Jun. '43), Field Engr., The M. W. Kellogg Co., Box 1912, Monroe, La. (Res., 508 South School St., Fayetteville, Ark.)

Puckhaber, Fred Henry (Assoc. M. '43), Div. Mgr., Wallace & Tiernan Co., Inc., 1112 Liberty Bank Bldg., Dallas, Tex.

Reeve, Ronald Cropper (Jun. '43), 7050 South 126th, Renwood Park, Seattle 88, Wash.

Richards, John Vinton (Jun. '43), with U.S. Army, Dearborn Rd., Suncook, N.H.

Richardson, Robert Bruce (Assoc. M. '34), Constr. and Maintenance Engr., State Dept. of Highways, Baton Rouge, La.

Richmond, Richard Thomas (Jun. '43), Private First Class, U.S. Army, Company D, 3200 S.C.S.U., A.S.T.U., New York Univ., New York 53, N.Y.

Rinderer, Rudolph Frederick (Jun. '43), Sales Engr., Midwest Piping & Supply Co., Inc., 30 Church St., New York, N.Y. (Res., 1232 Barbara Ave., Union, N.J.)

Roland, Harry Lewman (Assoc. M. '43), Constr. Engr., Modjeski & Masters, State Street Bldg. (Res., 3805 Derry St.), Harrisburg, Pa.

Rosenwach, Wallace (Jun. '43), 1626 Greenfeld Ave., West Los Angeles 25, Calif.

Royer, Daniel King (Jun. '43), Ensign, U.S. N.R., 3038 Washtenaw Rd., Ann Arbor, Mich.

Russell, Spruell Alton (Jun. '43), Public Works Director, City of Bay City (Res., 2113 Ave. I), Bay City, Tex.

Sall, Harry Herman, Jr. (Jun. '43), 2d Lt., Coast Artillery Corps, U.S. Army, 1400 Searle St., St. Paul 1, Minn.

Schacht, Otto William, Jr. (Jun. '43), Eng. Draftsman, Douglas Aircraft Co., Inc., El Segundo (Res., 833 Ocean Ave., Santa Monica), Calif.

Schott, Henry Karl (Jun. '43), Draftsman, Federal Shipbuilding & Dry Dock Co., 744 Broad St., Newark (Res., 520 Westminster Ave. Elizabeth), N.J.

Schroeder, Marianna Margaret (Miss) (Jun. '43), 2129 South 5th St., Springfield, Ill.

Seddon, Robert Steere (M. '43), Comdr., CEC, U.S.N.R., 17th Naval Constr. Battalion, Care, Fleet Post Office, New York, N.Y.

Sheikowitz, Isidore (Jun. '43), Stress Analyst, 254 East 174th St., New York 57, N.Y.

Shub, David Isaac (Jun. '43), Eng. Asst., Lockheed Aircraft Corp. (Res., 638 East Tujunga Ave.), Burbank, Calif.

Sinclair, William Daniel (Assoc. M. '43), Transmission Engr., State Public Service Authority, Moncks Corner, S.C.

Siu, George Patrick (Jun. '43), Engr., Goodyear Aircraft Corp., Wingfoot Lake Airship Base, Akron, Ohio.

Snyder, Eugene Fones (Jun. '43), 2d Lt., U.S.M.C.R., Ardentown, Del.

Soehngen, Henry Frank (Jun. '43), Corporal, U.S. Army, 93 George St., Brooklyn 6, N.Y.

Stacy, Joe Terrell (Jun. '43), 48 North Gillette, Tulsa, Okla.

Stallings, John Ralph, Jr. (Jun. '43), With U.S. Army, Byers, Kans.

Stanton, Irving Richard (Jun. '43), Junior Naval Archt., U.S.N., Navy Yard (Res., 14 Trumbo St.), Charleston 28, S.C.

Tan, Eng Joo (Jun. '43), 371 Harvard St., Apt. 8, Cambridge 38, Mass.

Tietjen, Frederick Henry (Jun. '43), With Corps of Engrs., U.S. Army, 13 Fifteenth St. South, Great Falls, Mont.

Toppen, Theodore Samuel (Jun. '43), Lt., Ordnance, U.S. Army, 627 South Bond St., Baltimore, Md.

Traquair, William Cameron (Jun. '43), Ensign, U.S.N.R., 178 Sumner St., Norwood, Mass.

Trudeau, Joseph Raymond Marc (Jun. '43), Instr. in Hydraulics, Ecole Polytechnique, 1430 St. Denis St., Montreal, Que., Canada.

Tuttle, Lansing (Jun. '43), Lt., Corps of Engrs., U.S. Army, Company A, 10th Battalion, Engr. Replacement Training Center, Fort Belvoir, Va.

Wagner, George Nicholas (Jun. '43), County Road Supt., Dist. 4, County Corporation Yard (Res., 833 Main St.), Watsonville, Calif.

Walker, Robert Hewitt (Jun. '43), Junior Stress Analyst, Consolidated Vultee Aircraft Corp. (Res., 3023 North West 26th St.), Fort Worth, Tex.

Ward, Edmund Bailey (Assoc. M. '43), Vice-Pres., Consolidated Eng. Co., 20 East Franklin St., Baltimore 2, Md.

Watson, Albert Theodore (Jun. '43), Junior Engr., U.S. Engrs., 205 South 4th (Res., 624 North Cedar), Albuquerque, N.Mex.

Weis, Carl Julius (Jun. '43), Lt., Air Force, U.S. Army, 2926 Indiana Ave., St. Louis 18, Mo.

Wetzel, Charles Ray (Assoc. M. '43), Structural Engr., The Austin Co., 16112 Euclid Ave., Cleveland (Res., 990 Caledonia Ave., Cleveland Heights), Ohio.

Whitenton, Robert Marshall (Jun. '42), 1st Lt., Corps of Engrs., U.S. Army, Company A, 131st Engr. Regiment, (C), Army Post Office 453, Care, Postmaster, San Francisco, Calif.

Wilson, Mark Leonard (Assoc. M. '43), Plant Engr., in Chg., Maintenance, National Union Radio Corp., 1181 McCarter Highway, Newark (Res., 652 Ridgewood Ave., Montclair), N.J.

Wolf, Howard Frank (Jun. '43), Senior Industrial Hygiene Aid, City Health Dept. (Res., 246 East Alexandrine), Detroit 1, Mich.

Wood, Alan Arthur (M. '43), (Luther & Wood), 310 Chandler Bldg., Washington, D.C. (Res., 4829 Drummond Ave., West Chevy Chase, Md.)

Wood, William Dulaney (Jun. '43), Midshipman, U.S.N.R., Earlysville, Va.

Wright, Leslie Austin (M. '43), Gen. Secy., The Eng. Inst. of Canada, 2050 Mansfield St., Montreal, Que., Canada.

Yoder, Sterling Norsworthy (Assoc. M. '43), Asst. Engr., (Civ.), U.S. Engr. Office, Fort Norfolk (Res., 1026 Larchmont Crescent), Norfolk, Va.

Yorke, Robert Bruce, Jr. (Jun. '43), Structural Engr. and Draftsman, Drydock Associates, Navy Yard (Res., 1513 South Broad St.), Philadelphia, Pa.

Membership Transfers

Bamberger, Sidney Francis (Jun. '36; Assoc. M. '43), Chf., Structural Engr., Pollack-Stockton Shipbuilding Co., Box 1848, Stockton, Calif.

Biermann, Arthur Edward (Jun. '33); Assoc. M. '43), Asst. Engr., Terminal R.R. Assn. of St. Louis, 360 Union Station (Res., 2431 McLaran Ave.), St. Louis, Mo.

Black, Joseph Kenneth (Assoc. M. '38; M. '43), Project Mgr., TVA, Fort Loudoun Dam, Lenoir City, Tenn.

Blackwell, Benjamin Richard (Jun. '38; Assoc. M. '43), with Tennessee Eastman Corp., Clinton Engr. Works, Oak Ridge (Res., 112 Fountain Ave., Knoxville 18), Tenn.

Carr, James Henry, Jr. (Jun. '37; Assoc. M. '43), in Chg., Eng. and Sales, Timber Eng. Co., 1319 Eighteenth St., N.W. (Res., 4831 Thirty sixth St., N.W.), Washington, D.C.

Cascino, David Dominic (Jun. '38; Assoc. M. '43), Structural Engr., Mahony-Troast Const. Co., 657 Main Ave., Passaic (Res., 65 Marsellus Pl., Garfield), N.J.

Chamberlain, Antonio Arrillaga (Assoc. M. '34; M. '43), Gen. Supt., Frederick Snare Corp., 114 Liberty St., New York, N.Y.

Cohen, Sigmund (Assoc. M. '30; M. '43), Maj., Corps of Engrs., U.S. Army, 8942 Dexter Blvd., Detroit 6, Mich.

Dekema, Jacob (Jun. '37; Assoc. M. '43), Asst. Bridge Engr., Bridge Dept., State Div. of Highways, Box 1499 (Res., 584 Thirty-fourth St.), Sacramento 16, Calif.

Elwin, Elmer Hill, Jr. (Jun. '35; Assoc. M. '43), Capt., Corps of Engrs., U.S. Army, 325 Harvard North, Seattle, Wash.

Fortier, Ernest Cleveland (Assoc. M. '26; M. '43), Dist. Engr., U.S. Indian Irrig. Service, 647 Phelan Bldg., San Francisco, Calif.

Gentleman, Lawrence Miles (Assoc. M. '30, M. '43), Div. Engr., Shreve, Lamb & Harmon; Fay, Spofford & Thorndike, 11 Beacon St., Boston (Res., 16 Marion Rd., Watertown), Mass.

Hall, Paul (Jun. '35; Assoc. M. '43), Div. Asst., Scheduling Div., Houston Shipbuilding Co., Irish Bend Island (Res., 2306 Huldy St.), Houston 6, Tex.

Hamlyn, Wilfred Thomas (Jun. '40; Assoc. M. '43), 902 Upson Ave., El Paso, Tex.

Johnson, Clarence West (Assoc. M. '32; M. '43), Constr. Supt., Alabama Power Co., Box 47, Gorgas, Ala.

Johnson, George Dugan (Jun. '39; Assoc. M. '43), Hydr. Engr., S. Morgan Smith Co., 500 Lincoln St., York, Pa.

Johnston, William Carleton (Assoc. M. '37; M. '43), Lt., CEC, U.S.N.R., Box 122, Marshall, Ark.

Lane, Albert Lossen (Jun. '18; Assoc. M. '23; M. '43), Col., Corps of Engrs., U.S. Army, 1301st Engr. Regiment, Camp Ellis, Ill.

Lewin, Joseph David (Jun. '35; Assoc. M. '38; M. '43), Stress Engr., Otis-Glen L. Martin Co., 26th St. and 11th Ave., New York (Res., 99 Lafayette Ave., Brooklyn 17), N.Y.

Masciocchi, Pius James (Jun. '37; Assoc. M. '43), Contract and Cost Engr., Constr., Div.,

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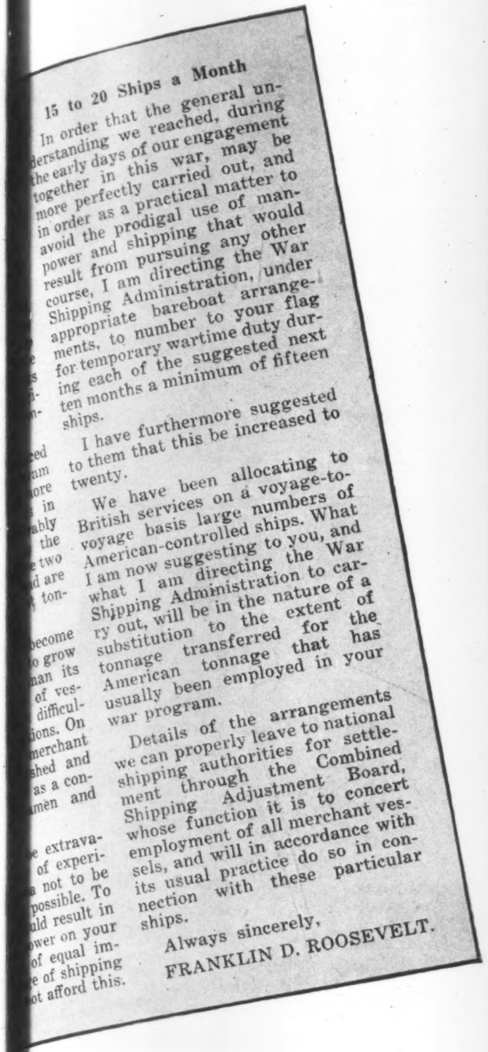

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Details of the arrangements we can properly leave to national shipping authorities for settlement through the Combined Shipping Adjustment Board, whose function it is to concert employment of all merchant vessels, and will in accordance with its usual practice do so in connection with these particular ships.

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FRANKLIN D. ROOSEVELT.

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OLRSON, CALVIN CARL (Assoc. M. '37; M. '43), Capt., Corps of Engrs., U.S. Army, 502 Twelfth Ave., Brookings, S.Dak.

OPPENHEIM, LOUIS HERMAN (Jun. '38; Assoc. M. '43), Asst. Chf. Engr., Iron and Steel Div., Kaiser Co., Inc., 522 Latham Sq. Bldg., Oakland 12, Calif.

PECK, REXFORD ERNEST (Assoc. M. '29; M. '43), Asst. Engr., Bridge Dept., M.P.R.R., 1211 Missouri Pacific Bldg. (Res., 6730 Clayton Ave.), St. Louis 10, Mo.

PFAU, ALBERT LINCOLN, JR. (Assoc. M. '22; M. '43), Superv. Engr., Reconstruction Finance Corp. (Res., 2970 West Grand Blvd.), Detroit 2, Mich.

PHILLIPS, ORLEY OLIVER (Assoc. M. '36; M. '43), Prin. Asst., Prouty Brothers Eng. Co., Exchange Bldg., Denver, Colo.

PORTER, ARZA FRANCIS (Jun. '34; Assoc. M. '43), Structural Engr., Public Works Div., U.S.N., Federal Bldg. (Res., 8127 Hickory St.), New Orleans 18, La.

RAWLINS, GEORGE SKEVINGTON (Assoc. M. '39; M. '43), Executive Vice-Pres., J. N. Pease & Co., Inc., 1107 Johnston Bldg., Charlotte 1, N.C.

SACKETT, GUY WOODFORD, JR. (Jun. '35; Assoc. M. '43), Fort George, Fla.

SCHRYVER, HOWARD FRENCH (Assoc. M. '14; M. '43), Asst. Engr. N.Y.C.R.R., 1324 West 3d St. (Res., 1087 Erie Cliff Drive, Lakewood), Cleveland, Ohio.

SPARKS, THOMAS CARR (Assoc. M. '41; M. '43), Industrial Engr., B. & O.R.R., 1104 B. and O. Central Bldg., Baltimore (Res., 204 Rosewood Ave., Catonsville), Md.

STUBBS, HENRY FRANKLIN (Assoc. M. '33; M. '43), Chf. Engr., Contrs., NOy-3680, Box 4269, San Juan, Puerto Rico. (Res., 336 Corona, Alamo Heights, San Antonio, Tex.)

TELLER, LESLIE WAYNE, SR. (Assoc. M. '26; M. '43), Prin. Engr. of Tests, U.S. Public Roads Administration, Federal Works Agency, Washington, D.C. (Res., 6402 Georgia St., Chevy Chase, Md.)

THOMPSON, SAMUEL HYDE (Assoc. M. '37; M. '43), Asst. Director, National Planning Assn., 800 Twenty-first St., N.W. (Res., 3535 R St., N.W.), Washington, D.C.

WILKEN, ROBERT HENRY (Jun. '38; Assoc. M. '43), Engr. (Civ.) U.S. Engr. Dept., 725 L St. (Res., 444 Yale Ave.), Fresno 4, Calif.

REINSTATEMENTS

ANDREWS, GEORGE DOUGLAS, M., reinstated Sept. 28, 1943.

BURTON, WILLARD AUGUSTUS, Assoc. M., reinstated Sept. 29, 1943.

CAREW, JOHN FRANCIS, JR., Assoc. M., reinstated Oct. 6, 1943.

DAVIS, PAUL DEXTER, Assoc. M., reinstated Sept. 28, 1943.

LUCCHESI, DAVID HOWE, Assoc. M., reinstated Sept. 28, 1943.

OLSON, KENNETH MILES, Assoc. M., reinstated Sept. 30, 1943.

PELETZ, HAROLD, Jun., reinstated Oct. 1, 1943.

SHENAMAN, IRVIN SHAFFER, Assoc. M., reinstated Sept. 1, 1943.

TILTON, GEORGE ALBERT, JR., Assoc. M., reinstated Sept. 1, 1943.

Applications for Admission or Transfer

Condensed Records to Facilitate Comment from Members to Board of Direction

NOVEMBER 1, 1943 NUMBER 11

The Constitution provides that the Board of Direction shall elect or reject all applicants for admission or for transfer. In order to determine justly the eligibility of each candidate, the Board must depend largely upon the membership for information.

Every member is urged, therefore, to scan carefully the list of candidates published each month in CIVIL ENGINEERING *and to furnish the Board with data which may aid in determining the eligibility of any applicant.*

It is especially urged that a definite recommendation as to the proper grading be given in each case, inasmuch as the grading must be based upon the opinions of those who know the applicant personally as well as upon the nature and extent of his professional experience. Any facts derogatory to the personal character or professional reputation of an applicant should be promptly communicated to the Board.

Communications relating to applicants are considered strictly confidential.

The Board of Direction will not consider the applications herein contained from residents of North America until the expiration of 30 days, and from non-residents of North America until the expiration of 90 days from the date of this list.

MINIMUM REQUIREMENTS FOR ADMISSION

GRADE	GENERAL REQUIREMENT	AGE	LENGTH OF ACTIVE PRACTICE	RESPONSIBLE CHARGE OF WORK
Member	Qualified to design as well as to direct important work	35 years	12 years	5 years RCM*
Associate Member	Qualified to direct work	27 years	8 years	1 year RCA*
Junior	Qualified for subprofessional work	20 years	4 years	
Affiliate	Qualified by scientific acquirements or practical experience to cooperate with engineers	35 years	12 years	5 years RCM*

* In the following list RCA (responsible charge—Associate Member standard) denotes years of responsible charge of work as principal or subordinate, and RCM (responsible charge—Member standard) denotes years of responsible charge of IMPORTANT work, i.e., work of considerable magnitude or considerable complexity.

APPLYING FOR MEMBER

ALEXANDER, ALBERT MANGUM, New Orleans, La. (Age 55) (Claims RCA 16.0 RCM 15.1) Feb. 1942 to date with Barnard, Godat & Heft, Cons. Engrs., as Chf. Engr., and (since March 1943) Prin. Engr.; previously with W. Horace Williams Co. as Asst. Gen. Supt., Asst. Project Mgr. and Gen. Supt.; with PWA, Atlanta, Ga.

ASMUS, LEWIS DURAND, Colorado Springs, Colo. (Age 49) (Claims RCA 3.9 RCM 17.7) March 1942 to date with Corps of Engrs., U.S. Army, as Captain, and since July 1943, Major, Air Forces; previously with U.S. PRA in various capacities.

BAIN, ALBERT JAMES, Columbus, Ga. (Age 62) (Claims RCA 26.8 RCM 8.0) Dec. 1941 to date Col., Corps of Engrs., U.S. Army, being Post Engr., Ft. Benning, Ga.; previously Staff Officer and Engr., Hdqrs., SAD, Div. Engr.'s Office; with Office of Constr. QM., Washington, D.C., later as Asst. Constr. QM., Anniston (Ala.) Ordnance Depot; Cons Engr., Chicago, Ill.

BRANDES, RAYMOND LAWRENCE, New York City. (Age 39) (Claims RCA 1.0 RCM 12.6) 1943 to date Structural Designing Engr., The Nicholson Co., Inc.; previously Supt. of Constr., W. J. Barney Corporation; Designer and Bldr. (private practice).

CARMICHAEL, HENRY ST. GEORGE TUCKER, JR., Kyrock, Ky. (Age' 36) (Claims RCA 2.0 RCM 8.7) Aug. 1941 to date Chf. Engr., Wilson, Bell & Watkins, Archt.-Engrs., Lexington, Ky.; previously Senior Engr., Slaughter, Saville & Blackburn, Archt.-Engrs., Richmond, Va.; Owner's Supervisor, Dept. of Bldgs. and Grounds, Univ. of Virginia.

FLEMING, PHILIP BRACKEN, Washington, D.C. (Age 56) (Claims RCA 10.7 RCM 14.0) 1911 to date with U.S. Army in various capacities, since 1941 being Administrator, FWA, Washington, D.C.; at present Major Gen.

FREEMAN, DELBERT BLISS (Assoc. M.), Omaha, Nebr. (Age 40) (Claims RCA 6.0 RCM 8.0) Jan. 1929 to date with U.S Engr. Office, in various capacities, since Sept. 1942 as Executive Asst. to Div. Engr.; Major and Lt. Col. U.S. Army.

GRESS, WALTER JOHN, Yonkers, N.Y. (Age 44) (Claims RCA 5.7 RCM 7.4) June 1930 to July 1942 Asst. Eng. Designer, and July 1942 to date Civ. Engr., Board of Water Supply, New York City.

HIMEBAUGH, HAROLD HOLLISTER, Webster Groves, Mo. (Age 45) (Claims RCA 11.0 RCM 8.0) 1924 to date Civ. Engr., Woermann Constr. Co., St. Louis, Mo.

KNEER, VERNON RALPH, Chicago, Ill. (Age 41) (Claims RCA 6.0 RCM 12.0) July 1925 to date Asst. Engr., Alvord, Burdick & Howson.

KUNSCH, HAROLD EDWARD (Assoc. M.), Baltimore, Md. (Age 37) (Claims RCA 9.0 RCM 6.2) Aug. 1940 to date with Whitman, Requardt & Smith, Engrs., Baltimre, Md., successively as Senior Structural Designer, Squad Leader, Asst. Project Engr., and Project Engr.; previously Bridge Designer, Bridge Div., Pennsylvania Turnpike Comm., Harrisburg, Pa.

LATTA, JAMES BULLEN, Bethesda, Md. (Age 44) (Claims RCA 12.5 RCM 6.6) July 1942 to date Senior Constr. Engr., Subregional Office, FWA; previously Office Engr. and Chf., Priority Sec., Emergency Operations Units, Public Buildings Administration.

LEGGET, ROBERT FERGUSON (Assoc. M.), Toronto, Ont., Canada. (Age 39) (Claims RCA 10.0 RCM 6.0) Sept. 1938 to Sept. 1943 Asst. Prof., and Sept. 1943 to date Associate Prof., of Civ. Eng., Univ. of Toronto.

MAYNARD, FRANK WILLIAM, Midland, Mich. (Age 47) (Claims RCA 9.5 RCM 10.7) June 1917 to date with The Austin Co. in various capacities, at present as Project Mgr.

MENG, CARL LEROY (Assoc. M.), Long Beach, Calif. (Age 47) (Claims RCA 2.8 RCM 8.3) Dec. 1940 to date with Corps of Engrs. in various capacities, at present as Lt. Col.; previously with U.S. Bureau of Reclamation.

MOLL, BERNARD, Grand Rapids, Mich. (Age 53) (Claims RCA 14.1 RCM 9.3) Aug. 1921 to date with Office of San. Engr., Grand Rapids, Mich., in various capacities, since Jan. 1930 as San. Engr.

PALMER, WAYNE FRANCIS (Assoc. M.), Mobile, Ala. (Age 48) (Claims RCA 4.3 RCM 14.5) Oct. 1941 to date Pres., Palmer and Baker, Inc.; previously member of firm, Wilberding Co., Washington, D.C., and later Vice-Pres., Wilberding & Palmer, Inc., Mobile, Ala.

PARISI, FRANCIS GENEROUS, Aruba, N.W.I. (Age 43) (Claims RCA 10.2 RCM 5.3) July 1940 to date Engr., Lago Oil & Transport Co., Co., Aruba, N.W.I. (subsidiary of Standard Oil Co. of New Jersey); previously Draftsman, and Designer, Lummus Co., New York City; Engr., WPA, New York City.

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INTERNATIONAL POWER

Polk, Wesley William, Springfield, Ill. (Age 50) (Claims RCA 2.0 RCM 21.0) March 1942 to date Chf. Highway Engr., State of Illinois; previously with Water Dept., Evanston, Ill., in various capacities.

Puente and Isalgue, Manuel de Jesus, Havana, Cuba. (Age 49) (Claims RCA 9.9 RCM 16.0) May 1936 to date engaged in private practice of civil and electrical engineering, Havana.

Reed, Floyd Levan (Assoc. M.), Severna Park, Md. (Age 49) (Claims RCA 3.0 RCM 19.9) Jan. 1930 to date with American Bitumuls Co. as Engr., San Francisco, Calif., and (since Jan. 1936) Asst. Dist. Mgr. and Acting Mgr., Baltimore, Md.

Ryder, Irving Lamphry, Morgan Hill, Calif. (Age 66) (Claims RCA 6.6 RCM 31.0) Jan. 1923 to July 1932 Pres. and Mgr., San Jose (Calif.) Paving Co., and July 1927 to Dec. 1942 operated as Irving L. Ryder, Asphalt Pavements.

Schellkopf, Sigmund Walter, Akron, Ohio. (Age 47) (Claims RCA 5.9 RCM 9.6) Nov. 1942 to date Senior Structural Designer, Goodyear Aircraft Corporation; previously Structural Designer, J. E. Sirrine & Co., Greenville, S.C.; Structural Engr., Giffels & Vallet, Inc., Naval Operating Base, Norfolk, Va; Structural Designer, Mills, Rhines, Bellman & Nordoff, Toledo, Ohio.

Shelburne, Tilton Edward, Lafayette, Ind. (Age 40) (Claims RCA 7.0 RCM 9.2) June 1936 to date Research Engr., Joint Highway Research Project, cooperative with Purdue Univ.

Staples, Leroy Augustus (Assoc. M.), Shreveport La. (Age 39) (Claims RCA 5.4 RCM 8.2) March to Aug. 1930, Oct. to June 1933, and Sept. 1934 to date with George P. Rice, Cons. Engr., New Orleans, La., after 1936 as Partner acting as Chf. Engr. and Project Engr.; in the interim with CWA and FERA.

Stribling, William John (Assoc. M.), Port Hueneme, Calif. (Age 42) (Claims RCA 5.7 RCM 7.0) Sept. 1939 to May 1941 Lieut., and May 1941 to date Lieut. Commdr., CEC, U.S. Naval Reserve on active duty; previously Engr., Blythe Bros. Constr. Co., Contrs.

Viney, Alvin Galt, Miami, Fla. (Age 38) (Claims RCA 3.2 RCM 6.4) 1930 to date with Corps of Engrs., U.S. Army, at present as Colonel.

Ward, Roy Elsen (Assoc. M.), Los Angeles Calif. (Age 57) (Claims RCA 5.8 RCM 22.4) Aug. 1918 to date with The Austin Co. (The Austin Co. of California), in various capacities, since Jan. 1935 as Mgr., Los Angeles Dist. Office.

Wartelle, Charles Leopold, Seattle, Wash. (Age 58) (Claims RCA 6.7 RCM 20.4) July 1907 to Aug. 1933 and May 1938 to date with City of Seattle in various capacities, at present as City Engr.; in the interim Chf. Engr., PWA, State of Washington.

Winter, George, Ithaca, N.Y. (Age 36) (Claims RCA 3.3 RCM 9.0) 1938 to date at Cornell Univ. on various work, since 1940 successively Research Associate, Instructor, and (since June 1942) Asst. Prof.; 1943 occasionally on consulting with Prof. C. E. O'Rourke, Cons. Engr.

APPLYING FOR ASSOCIATE MEMBER

Adams, Robert Francis (Junior), Manhattan Kans. (Age 31) (Claims RCA 2.5) July 1936 to Aug. 1937 and Aug. 1943 to date with Kansas State Coll., at present as Instructor, Physics Dept.; in the interim with Lehigh Portland Cement Co., and Kansas Highway Comm.

Armstrong, Ellis Leroy (Junior), Anderson Dam, Idaho. (Age 29) (Claims RCA 5.1) June 1936 to date with U.S. Bureau of Reclamation in various capacities, since Jan. 1942 being Asst. and Associate Engr.

Baszner, Raymond Walsh (Junior), Providence, R.I. (Age 34) (Claims RCA 3.6 RCM 0.8) Jan. 1943 to date with Corps of Engrs., U.S. Army, at present as 1st Lieut.; previously Chf. Field Engr., P. T. Cox Constr. Co. and Spears, Preston & Burrows Co., Newport, R.I.; Field Engr. with F. M. McGraw, Purdy-Henderson Co., Bermuda, and Gilbane Bldg. Co. & Holt-Fairchild Association, Middletown, R.I.

Bayliss, Arthur Ernest, Seattle, Wash. (Age 45) (Claims RCA 9.6) Nov. 1938 to date with U.S. Engr. Office, as Asst. Engr., Associate Engr., and (since Feb. 1943) Senior Engr.

Benzon, Frank Browning, Albany, Calif. (Age 31) (Claims RCA 8.6) March 1935 to July 1940 and Oct. 1941 to date with Summerbell Roof Structures, at present in Oakland, Calif., as Gen. Mgr. and Chf. Engr.; in the interim Draftsman and Designer, R. H. Cooley, Structural Engr.

Bermel, Karl John, Berkeley, Calif. (Age 34) (Claims RCA 4.6) Sept. 1933 to date with U.S. Forest Service, Dept. of Agriculture, in various capacities, since Aug. 1941 being Statistical Draftsman, Chf. Eng. Aide, and Asst. Hydr. Engr.

Bledsoe, Byron Augustus (Junior), Atlanta, Ga. (Age 32) (Claims RCA 2.3) June 1942 to date 1st Lieut., and (at present) Capt., Corps of Engrs., and Asst. Chf., Engr. Branch, Fourth Service Command; previously Jun. Engr., Vicksburg Eng. Dist.

Campbell, Richard Trent (Junior), San Antonio, Tex. (Age 32) (Claims RCA 8.7) Sept. 1936 to date Representative and Contr. Engr., Mosher Steel Co., San Antonio, Tex.

Carleton, Robert Gould, Miami, Fla. (Age 33) (Claims RCA 2.0 RCM 0.8) Dec. 1940 to date with Pan American Airways, Airport Development Program, Miami, Fla., successively as Jun. Engr., Senior Estimating Engr., and (since Dec. 1942) Statistical Engr.; previously Engr., Gibbs & Cox, New York City; Instrumentman, Shell Oil Co., New York City.

Cowan, Cedric Langton, Louisville, Ky. (Age 34) (Claims RCA 9.5 RCM 2.2) March 1934 to date with U.S. Engr. Office in various capacities, since Jan. 1943 as Engr.

Faustman, Daniel Jackson (Junior), Fort Belvoir, Va. (Age 27) (Claims RCA 1.8 RCM 1.4) Sept. 1940 to date with Corps of Engrs., U.S. Army, in various capacities, since May 1942 as Capt.; previously Asst. Traffic and Planning Engr., Sacramento, Calif.

Gordon, John Andrew, Los Angeles, Calif. (Age 42) (Claims RCA 6.1) Jan. 1938 to Jan. 1941 and March 1941 to date Structural Draftsman, successively with F. Dlouhy, and S. B. Barnes, Structural Engrs., in the interim Structural Engr. with Martin Pohl, Structural Engr.; previously draftsman with Harry Wildman, Archt.

Gregory, Paul Duke (Junior), Ft. Worth, Tex. (Age 28) (Claims RCA 2.5) at present awaiting induction, U.S. Marine Corps Reserve; Aug. 1942 to Aug. 1943 with Brown & Bellows Constr. Co., McAlester, Okla., first as Senior Engr., then Party Chf. (Field Engr.); previously Engr., Brown & Root, Inc., Texarkana, Tex.; with Texas Highway Dept. in various capacities.

Griggs, Chandler Babbitt (Junior), Washington, D.C. (Age 33) (Claims RCA 2.5 RCM 2.1) Nov. 1937 to date with CAA in various capacities, since June 1942 being Senior Airways Engr., Alaska.

Grubb, William Allen, Seattle, Wash. (Age 51) (Claims RCA 19.3 RCM 8.0) March 1926 to date with Portland Cement Association as Dist. Engr. and Field Engr.

Herbert, Charles Frank, Borger, Tex. (Age 29) (Claims RCA 2.1) Oct. 1936 to date with Phillips Petroleum Co. in various capacities, since March 1942 as Engr.

Jelin, Jerome Kalmon, Miami, Fla. (Age 32) (Claims RCA 2.5 RCM 5.5) 1942 to date Office and Cost Engr., Pleasantville Constrs., Inc., Bahamian Operations; previously Gen. Mgr., Franklin Constr. Co., New Brunswick, N.J.

King, Oren Lester, Montrose, Colo. (Age 34) (Claims RCA 2.2 RCM 3.0) Feb. 1942 to date Mgr. and City Engr., Montrose, Colo.; previously Camp Engr., CCC Div., Bureau of Reclamation, Montrose; with Colorado Highway Dept.

Kulas, Frank Edward, Rochester, N.Y. (Age 34) (Claims RCA 5.5) Feb. 1943 to date Cost Engr.; Eastman Kodak Camera Works; previously Engr. Coordinator, J. W. Cowper Co.. Buffalo, N.Y.; Asst. Road Supt., Johnson & Mt. Vernon, Contrs., Sampson, N.Y.; Materials Engr., R. W. Hunt Co., New York City.

Long, Gerald Wilburn, Hamilton, Tex. (Age 35) (Claims RCA 3.7) July 1942 to date Eng. and Operations Officer, acting as Project Engr., Corps of Engrs.; previously Chf. Cost Engr., Atlanta Engr. Dist.; Engr. Inspector, Fort Bliss cantonment, Wyatt C. Hedrick, Inc.; Area Engr., WPA, Waco, Tex.

Lortz, Christian John, Baltimore, Md. (Age 41) (Claims RCA 5.8) June 1926 to date with City of Baltimore in various capacities, since Feb. 1938 as Associate Civ. Engr. of Highways.

McDonald, Walter Scott, Dallas, Tex. (Age 35) (Claims RCA 3.1 RCM 5.3) April 1942 to date Senior Engr., Public Works Dept., Dallas, since May 1943 being Asst. to Director; previously with Texas Highway Dept., Dallas, in various capacities.

McGlashon, Donald Walker, Richmond Heights, Mo. (Age 41) (Claims RCA 11.4 RCM 3.5) Oct. 1942 to date Capt., Corps of Engrs., U.S. Army; previously Field Structural Engr. and Regional Highway Engr., Portland Cement Association.

Morgan, Milan James, Chesterton, Ind. (Age 34) (Claims RCA 3.9) Jan. 1941 to date Designing Engr., Standard Oil Co., Whiting, Ind.; previously Eng. Expediter, U.S. Steel Co., Gary, Ind.; Design Engr., Shell Oil Co., East Chicago, Ill.

Nichols, Paul Lewis (Junior), Camp Abbot, Ore. (Age 31) (Claims RCA 5.8) June 1942 to date Capt. and Maj., Corps of Engrs., U.S. Army; previously with Bridge Dept., State Highway Dept., Carson City, Nev., as Bridge Draftsman, then Bridge Designer; Asst. Structural Engr., St. Lawrence River Dist., U.S. Engr. Dept., Massena, N.Y.

Pettitt, William Edgar, Cleveland, Ohio. (Age 46) (Claims RCA 5.5) 1942 to date Constr. Engr., Newsom & Aldrich, Cons. Engrs., New York City; previously Associate Constr. Engr., FWA, Richmond, Va.; Asst. Engr., War Dept., Washington, D.C.; Constr. Engr., E. B. Badger & Sons, Plumbrook Ordnance Works, Sandusky, Ohio; with The Austin Eng. Co., Cleveland; Res. Engr., PWA, Chicago, Ill.

Romero, Fernando, Knoxville, Tenn. (Age 30) (Claims RCA 3.5) July 1943 to date studying with TVA, Knoxville; previously under appointment by Gov. of Colombia studying rural electrification methods and procedures with Rural Electrification Administration, St. Louis, Mo.; with Ministry of National Economy, Bogota, Colombia.

Russell, John Tucker (Junior), London, England. (Age 34) (Claims RCA 5.5 RCM 2.5) 1937 to date with W. & G. French, Ltd., as Engr. and Contrs. Agt.

Shull, Ivan Franklin, Silver Spring, Md. (Age 37) (Claims RCA 4.6) 1941 to date with Farm Security Administration, as Associate San. Engr., and (at present) Senior San. Engr.; previously San. Engr., Sedgwick County Health Dept., Wichita, Kans.

Smith, George William (Junior), Sacramento, Calif. (Age 34) (Claims RCA 1.5) Sept. 1927 to date with California Dept. of Public Works, Bridge Dept., Div. of Highways.

Smith, Thomas Alexander, Dallas, Tex. (Age 38) (Claims RCA 10.9) March 1933 to date with Texas Highway Dept. in various capacities, since July 1942 as Jun. Res. Engr.

Strout, Harold Kimball, Toledo, Ohio. (Age 46) (Claims RCA 16.5 RCM 4.0) Sept. 1936 to date in private practice, after Jan. 1940 as member of firm, which in 1942 became Finkbeiner, Pettis & Strout.

Taylor, George Edward, Jr. (Junior), New River, N.C. (Age 33) (Claims RCA 8.8 RCM 0.6) April 1941 to date with Carr & J. E. Greiner Co., at New River, N.C., as Asst. San. Engr., and since April 1943 San Engr.; previously Asst. San. Engr., J. E. Greiner Co.; Safety Engr., U.S. Fidelity & Guaranty Co.

Van Atta, Fred Foster (Junior), North Charleston, S.C. (Age 31) (Claims RCA 3.2 RCM 2.3) Oct. 1941 to date with Corps of Engrs., U.S. Army, successively as 2d Lt., 1st Lt., and Capt., being Asst. to Dist. Engr., Charleston, S.C.; previously Structural Steel Designer and Detailer, Jarvis Eng. Works, Lansing, Mich.; Jun. Engr., U.S. Engr. Office, Los Angeles, Calif.; with TVA.

Willis, Cecil Lon, Omaha, Nebr. (Age 40) (Claims RCA 6.3 RCM 2.5) June 1942 to date Associate Engr. (Civ.), War Dept., U.S. Engrs.; previously Res. Engr., Paulette & Wilson Engrs., Salina and Topeka, Kans.

Wittman, Otto Joseph, Pasadena, Calif. (Age 35) (Claims RCA 0.8 RCM 1.1) Oct. 1938 to date with U.S. Geological Survey, as Recorder, Jun. Engr., and (since Nov. 1942) Asst. Engr.

APPLYING FOR JUNIOR

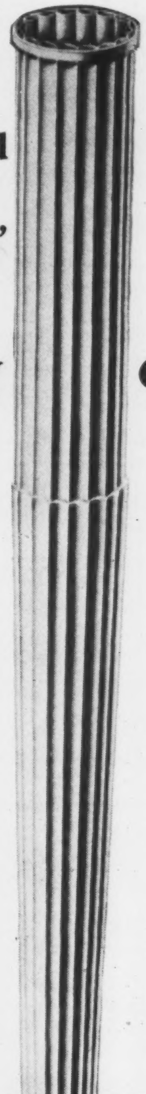
Allen, Robert Alfriend, St. Albans, W.Va. (Age 30) (Claims RCA 1.9) Aug. 1941 to date Structural Engr. and Draftsman, Carbide & Carbon Chemicals Corporation, South Charleston, W.Va.; previously with Bridge Dept., West Virginia Road Comm.

Dougherty, Nathan Samuel, Knoxville, Tenn. (Age 26) Dec. 1938 to date with TVA, since Oct. 1942 as Jun. Highway Engr.

Gennaro, Joseph John, Philadelphia, Pa. (Age 24) June 1940 to date Associate Naval Archt., Philadelphia Navy Yard; previously Jun. Hydr. Engr., U.S. Engr.'s Office, Pittsburgh, Pa.; Fellow, Dept. of Civ. Eng., Coll. of City of New York.

Gerber, Samuel, Forest Hills, N.Y. (Age 26) (Claims RCA 2.0) Feb. 1937 to date with M. Gerber Constr. Co., Inc., Brooklyn, N.Y.

Parga, Roberto Espinosa, Bogota, Colombia. (Age 23) Jan. 1943 to date Head of Dept. of Mun. Eng. in Secretary of Public Works, Tolima Dept., Republic of Colombia; previously Draftsman, San. Eng. Dept., Ministry of Public Health.



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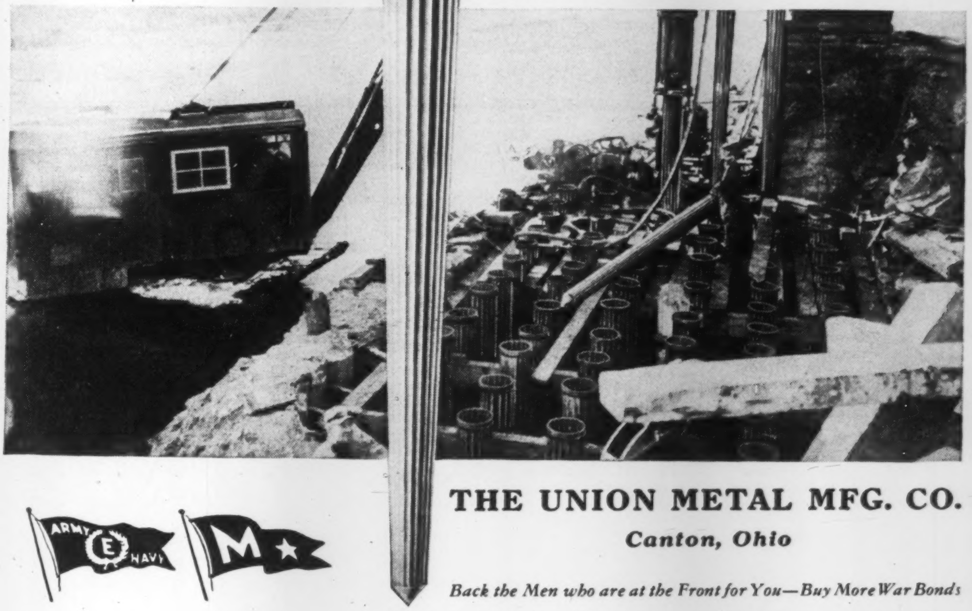

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Pattillo, Juan, Ann Arbor, Mich. (Age 24) Feb. 1943 to date graduate student, Univ. of Michigan; previously Asst. Engr., Highway Dept. of Chile, Bridge Design Sec.

Rogers, Glenn Herbert, Sacramento, Calif. (Age 31) (Claims RCA 1.0) July 1940 to date with U.S. Bureau of Reclamation, Eng. Investigations Sec., Central Valley Project, Sacramento, Calif., in various capacities, since Sept. 1942 as Asst. Engr.

Woodworth, Charles Holm, Brooklyn, N.Y. (Age 27) Dec. 1941 to date Designing Engr., Timber Structures, Inc.; previously Draftsman, Oregon Shipbuilding Corp., with Verne Ketchum, Asst. Eng. Aide, Soils Testing Laboratory, U.S. Army Engrs., all in Portland, Ore.

1941 GRADUATE

UNIV. OF ILL.

(M.S. in C.E.)

	AGE
OZELSEL, AHMET MUNCI	(26)

1942 GRADUATES

RENS. POL. INST.

(B.C.E.)

OLSON, HENRY ALLEN	(20)

TEX. A. & M. COLL.

(B.S.)

LATHAM, ROBERT EVANS	(23)

1943 GRADUATES

COLUMBIA UNIV.

(B.S. in C.E.)

STAPLEFELD, WILFRED PAUL	(21)

COOPER UNION

(B.C.E.)

PLATT, MATHEW	(21)
WEINBERGER, LEON WALTER	(20)

UNIV. OF FLA.

(B.C.E.)

HENRY, ALLEN KEENE	(26)

UNIV. OF ILL.

(B.S.)

BACON, LOUIS ALBERT	(22)
CLINTON, HAROLD	(21)
EPSTEIN, SIDNEY	(20)
GRUNERT, ALLISON CARTER	(22)
LEAVITT, SHELDON JOSEPH	(21)
MUELLER, ERWIN FERDINAND	(25)
OGDEN, WILLIS LIMLE	(21)

(M.S. in C.E.)

ALADJEM, NISSIM TCHELEBI	(24)
TOKAY, MEHMET NEJAT	(22)

IOWA STATE COLL.

(B.S.C.E.)

BLOEM, DELMAR LEWIS	(21)
MILLER, ROY EVERETT, JR.	(23)
ROHRBERG, CHARLES FOLKERT	(26)

THE JOHNS HOPKINS UNIV.

(B.E.)

DUQUETTE, HERBERT EVAN, JR.	(20)
FISHEL, MANNES HERMAN	(21)
JENKINS, GEORGE SIMS, JR.	(21)
NELSON, DAVID HYMAN	(24)
RICHARD, TRUMAN CHARLES	(25)
VALENZIANO, SALVATORE LEO	(22)
WOLMAN, LEE MARC GORDON	(21)

KANS. STATE COLL.

(B.S. in C.E.)

HENRY, KENNETH HILLIS	(22)
JONES, FRANK WARREN	(20)
MILLS, RAY ORVILLE	(22)
PEINE, PERRY CUSHMAN	(20)

UNIV. OF KANS.

(B.S. in C.E.)

BARNUM, WILLIAM JOSEPH	(26)
MOSER, THEODORE HARRISON	(23)

UNIV. OF LOUSIVILLE

(B.C.E.)

DICKSTEIN, DAVID DONALD, JR.	(23)
GIBBONS, EARL FOREE	(21)
JOHNSON, NICK GEORGE	(23)
PETER, WILLIAM JOSEPH EMIL, JR.	(22)

UNIV. OF MINN.

(B.C.E.)

CARLSON, HAROLD VERNER	(22)

UNIV. OF MISS.

(B.S. in C.E.)

WITTY, JOSEPH BINGHAM	(20)

MO. SCHOOL OF MINES & MET.

(B.S. in C.E.)

McKINNEY, GARTH GLEN	(23)

RICE INST.

(B.S. in C.E.)

CRUTCHFIELD, CHARLES RANDOLPH, JR.	(22)

UNIV. OF TENN.

(B.S. in C.E.)

DIKE, WILLARD MARSHALL	(25)
PATTON, THOMAS FRANKLIN	(22)

TEX. A. & M. COLL.

(B.S. in C.E.)

BENET, HUMBERTO JUAN	(21)

UNIV. OF TEX.

(B.S. in C.E.)

SHINGLE, JOHN HAYNE	(22)
WESTPHAL, JIM WOMBLE	(22)

UNION COLL.

(B.S. in C.E.)

LOWE, ROBERT BURGUM	(23)

VANDERBILT UNIV.

(B.E.)

SWIGGART, WILLIAM HARRIS, III	(23)

STATE COLL. OF WASH.

(B.S. in C.E.)

WILLIAMS, WILHO EDWARD	(21)

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Civil Engineer; Jun. Am. Soc. C.E.; 25; M.S.C.E., Massachusetts Institute of Technology; 3½ years designing bridges, fortifications, and buildings; 2 years as construction engineer on subways and tunnels. Excellent training as stress analyst. At present studying for doctorate. Willing to leave country for war areas. C-24.

Executive Engineer; Assoc. M. Am. Soc. C.E.; 54; B.S.C.E. and C.E., Purdue University; licensed in three states and reciprocal registration; for past 3 years with one firm on ordnance, chlorine, and light metal plants; previous 30 years on water supply, sanitation, drainage, structural, municipal, general problems—almost 20 of them in own practice. Location not so important as permanence and satisfaction to both parties. C-25.

Civil Engineer; Jun. Am. Soc. C.E.; 30; B.S.C.E.; licensed professional engineer in New York; 8 years' varied experience including surveying, structural design of bridges and industrial buildings, and sewerage; technical author. First lieutenant, AUS; expects retirement for medical reasons preventing service in combat zones. Prefer Northeastern United States or California. C-26.

Civil Engineer or Professor of Civil Engineering; M. Am. Soc. C.E.; research engineer with 20 years' experience covering a wide range; paving, water supply, sanitation, railroad construction, engineering materials, and structural design. Each of considerable magnitude. Specialist on stresses or design; prefer South or West. $5,000. C-27.

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Structural Steel Checker. Must have well-rounded experience in structural steel design. Man who has had crane and hoist experience preferred. Should also have a good knowledge of mechanics. Salary open. Location, New Jersey. W-2733.

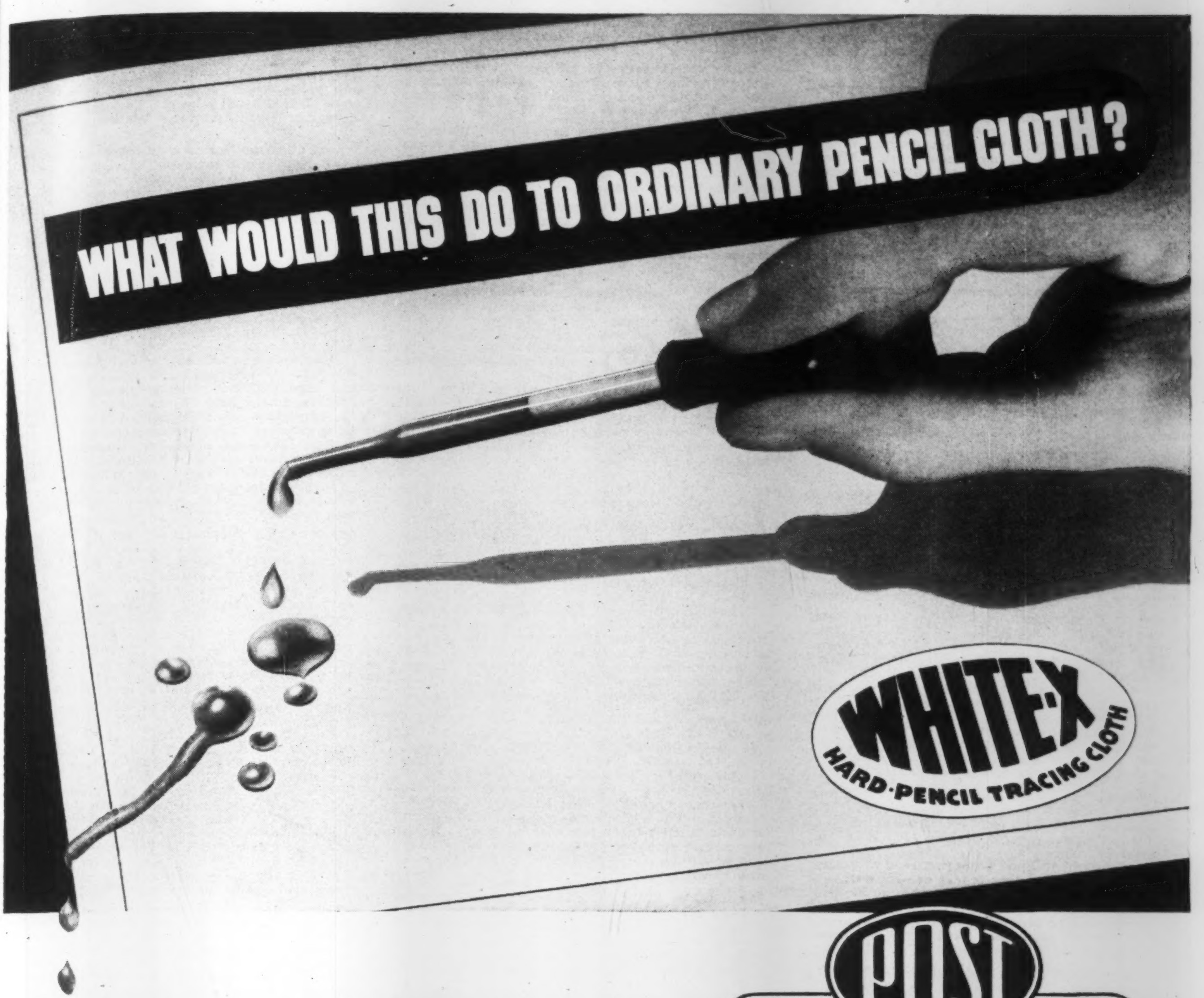
Sales Promotion Engineer who is well acquainted with water treatment and sanitary engineering practice, qualified by sales or advertising experience to head sales promotion work of an important manufacturer. Must also be competent to do long-range planning as well as handle current promotional problems. Experience in the preparation of informational bulletins, direct mail, etc., desirable. Salary, about $5,000 a year. Location, New York, N.Y. W-2737.

Sales Engineers, 40–45, experienced in construction equipment industry or qualified to train in the construction industry. Will serve as district representatives in given territories in the sales promotion work of construction equipment of manufacture to contractors. Should have outstanding sales ability and be a good mixer. Locations: one in San Francisco for Pacific Coast territory; one in Chicago to cover Central West territory; one in Cleveland to cover Middle West territory; and one in New York to cover New York State and New England. W-2743.

Assistant Professor-Instructor, graduate civil engineer, preferably with advanced degree to teach indeterminate structures. Must have had some previous experience in structural design. Salary open. Location, northern New Jersey. W-2786.

Draftsman for structural steel, architectural, plumbing, and heating piping layout. Salary, $3,380–$4,680 a year including overtime. Temporary. Location, Tennessee. W-2798.

Accountant who has had some experience on construction cost accounts—preferably one who has his C.P.A., although this is not essential if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Indianapolis	MKT. 4466	Toledo	ADAMS 7224
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Civil Engineer, executive, not over 40, experienced in pre-stress concrete design such as bridging, building frame work, etc. Salary, about \$7,200 a year. Location, New York, N.Y. W-2828.

Engineer-Draftsman for work in connection with pollution control. Salary, \$2,400–\$3,000 a year depending upon qualifications. Permanent. Location, Washington, D.C. W-2832.

Structural Designer with steel experience, preferably on plate work. Should also have a knowledge of welding. Salary, \$4,680 a year. Location, Alabama. Company will pay traveling expenses to and from job. W-2842(b).

Engineers. (*a*) Construction Engineer who has had experience in a supervisory capacity, particularly in building warehouses, tanks, and piping layouts. Salary, \$5,400 a year plus board and keep. Knowledge of Spanish helpful. Two-year contract. Location, South America. (*b*) Transitmen, not over 45, for land survey and line and grade work. Salary, \$3,600–\$4,200 a year plus board and keep. Two-year contract. Location, South America. W-2865.

Instructors for war-training courses in a local New York metropolitan college. School requires men to teach civil, mechanical, and electrical subjects; also mathematics, physics, and geography. Salary, \$2,400–\$3,600 a year. W-2887.

RECENT BOOKS

New books of interest to Civil Engineers donated by the publishers and filed in the Engineering Societies Library, or in the Society's Reading Room, will be found listed here. The notes regarding the books are taken from the books themselves and are edited by members of the staff of the Society or of the Library. Those books which are in the Library may be borrowed by mail by Society members for a small handling charge.

Airport Construction and Operation Reference, 1943–1944 Annual Edition. Occidental Publishing Co., Los Angeles, San Francisco, and New York, March 1943. 96 pp., illus., diagrs., tables, 12 × 9 in., cardboard, \$2.

In the text of this book the subjects of airport design, seaplane bases, war airfields, airport surfaces, buildings, lighting, communications, and traffic control are presented by useful summaries of practice. In addition, there is a buyer's directory of manufacturers of airport equipment and a directory of associations and agencies.

Blueprint Reading for the Shipbuilding Trades. By A. E. Niederhoff. McGraw-Hill Book Co., New York and London, 1943. 87 pp., illus., diagrs., charts, tables, 11 × 8 in., cloth, \$2.

The fundamentals of blueprint reading necessary for the shipbuilding trades are covered in a simple and concrete manner. Orthographic projection, alphabet of lines, symbols, abbreviations, and ship terms are included. Actual prints used in shipyards, mainly for Liberty Ship construction, are shown as examples.

Calculus Made Easy, 2 ed. enlarged. By S. P. Thompson. The Macmillan Co., New York, 1914 (reprinted 1943). 301 pp., diagrs., charts, tables, 7 × $4\frac{1}{2}$ in., cloth, \$2.

This little textbook—offered as "a very simplest introduction to those beautiful methods of reckoning which are generally called by the terrifying names of the differential calculus and the integral calculus"—first appeared, anonymously, in 1910. In 1914 an enlarged edition appeared under the author's name, which is now reprinted. In vigorous, colloquial style it presents the fundamentals of the calculus for the benefit of students of engineering and science.

Elementary Surveying, 2 ed. (Vol I). By William U. Rayner. D. Van Nostrand Company, Inc., New York, 1943. 419 pp., illus., tables, diagrs., charts, 8 × 5 in., leather, \$3.

Revised in accordance with the requirements of elective and required courses in surveying in the engineering schools. A number of articles have been added, or revised, and the chapter on land surveying has been entirely rewritten. New articles include the calculation of missing parts of a traverse, and of areas by the method of Double Meridian Distances.

Engineering Drawing Problems. By I. N. Carter and H. L. Thompson. International Textbook Co. (Scranton, Pa.), 1943. 142 plates, diagrs., charts, tables, $8\frac{1}{2}$ × 12 in., stiff paper, \$2.25.

A carefully selected group of drafting exercises—designed to be used with the text, *Engineering Drawing–Practice and Theory*, by the same authors—is presented. In addition to the problem plates already made up, there are several blank plates for special work, and a number of sheets of tracing paper are provided for tracing practice.

Fluid Mechanics. By R. C. Binder. Prentice-Hall, New York, 1943. 307 pp., illus., diagrs., charts, tables, $9\frac{1}{2}$ × 6 in., cloth, \$5.

The aim of this book is to present the fundamentals of fluid mechanics. Both liquids and gases are dealt with, and the general cases of flow in pipes and in open channels are considered. The general arrangement is logical, beginning with statics, then kinematics, then dynamics which receives the fullest treatment. Applications to such practical subjects as lubrication and pumping are discussed.

Foundations, Abutments and Footings, 2 ed., compiled by a staff of specialists. Editors-in-chief, G. A. Hool and W. S. Kinne; revised by R. R. Zipprodt and E. J. Kilcawley. McGraw-Hill Book Co., New York and London, 1943. 417 pp., illus., diagrs., charts, tables, $9\frac{1}{2}$ × 6 in., cloth, \$4.

This standard textbook covers soil investigation, excavation, foundations, spread footings, underpinning, bridge piers, and abutments. There is a section devoted to foundations requiring special consideration, and a section on the application of the law relative to the engineer. As twenty years have elapsed since the previous edition was published, the book has been extensively revised with much rewriting.

Fundamentals of Stress Analysis, Vol. 1. By A. Deyarmond and A. Arslan. Prepared and edited by Associated Aeronautical Staff of Aero Publishers, Glendale, Calif., 1942. 256 pp., diagrs., charts, tables, $9\frac{1}{2}$ × 6 in., cloth, \$3.

The purpose of this book, the first of a two-volume textbook, is to describe fundamental methods of analyzing the stresses in the types of structures that are used in airplanes. The subject is presented in a simple, practical manner. Previous knowledge of simple mathematics, mechanics, and strength of materials is assumed.

Geomorphology, Systematic and Regional. By O. D. von Englen. The Macmillan Co., New York, 1942. 655 pp., illus., diagrs., maps, $9\frac{1}{2}$ × 6 in., cloth, \$4.50.

This volume is an important addition to the literature, which will be welcomed by all geologists interested in modern developments in geomorphology. The treatment is inclusive, and the text is abundantly illustrated with photographs and drawings. An extensive bibliography is appended and is supplemented by topical bibliographies in each chapter.

Manual of A.S.T.M. Standards on Refractory Materials, prepared by A.S.T.M. Committee C-8 on Refractories. American Society for Testing Materials, Philadelphia (260 S. Broad St.), June 1943. 201 pp., illus., diagrs., charts, tables, 9 × 6 in., paper, \$1.50; cloth, \$1.75.

Designed to give all of the A.S.T.M. standards on refractory materials—specifications, methods of physical tests, chemical analysis, and definitions—this extensively revised and enlarged publication also includes pertinent data developed by the committee and gives other supplementary information of service to those concerned with refractories.

Materials and Methods of Architectural Construction, 2 ed. By C. M. Gay and H. Parker. John Wiley & Sons, New York; Chapman & Hall, London, 1943. 636 pp., illus., diagrs., charts, tables, $8\frac{1}{2}$ × $5\frac{1}{2}$ in., cloth, \$6.

Part I discusses the composition, characteristics, production, and uses of the commonly used materials of construction. Part II covers the mechanics of materials, methods of combining them for architectural construction, and the computation of dimensions. The present edition has been revised in accordance with current standards and practice.

Materials Handling, Principles, Equipment, and Methods. By H. E. Stocker. Prentice-Hall, New York, 1943. 309 pp., illus., diagrs. charts, tables, $9\frac{1}{2}$ × 6 in., cloth, \$5 (\$3.75, school edition).

The fundamental principles involved in the economical handling of those materials not handled in bulk, and the equipment and methods used, are described and explained in this text. A great deal of information about trucks, tractors, conveyors, cranes, and other equipment is provided, and there are many illustrations.

Municipal and Rural Sanitation, 3 ed. By V. M. Ehlers and E. W. Steel. McGraw-Hill Book Co., New York and London, 1943. 449 pp., illus., diagrs., charts, tables, 9 × 6 in., cloth, \$4.

The varied subjects dealt with by the sanitary engineer are discussed in this elementary textbook. Sewerage and sewage disposal and the development and purification of water supplies are standard topics. Other activities covered include the sanitation of milk and other foods; refuse collection and disposal; the control of mosquitoes, flies, and rodents; plumbing; and other aspects of public health work.

Public Works Engineers' Yearbook 1943. American Public Works Association, Chicago (1313 East 60th Street), 1943. 333 pp., illus., tables, diagrs., charts, $8\frac{1}{2}$ × $5\frac{1}{2}$ in., cloth, \$3.75.

This volume is an authoritative reference text on current techniques and practices, reflecting the impact of war conditions upon essential operations in the field of public service. Intended for administrators and engineers in this field, the book gives up-to-date information on a variety of topics, including employee relations, financial programming, public works in civilian defense, substitutes and salvage, traffic, airports, revisions in highway design, wartime operation of sewerage systems, and developments in refuse collection and disposal.

Slide Rule Simplified. By C. O. Harris. American Technical Society, Chicago, Ill., 1943, 250 pp., diagrs., tables, $8\frac{1}{2}$ × $5\frac{1}{2}$ in., cloth, \$2.50; with slide rule, \$3.50.

The practical manipulation of the slide rule is explained in detail. The first eight chapters cover the relatively simple straight arithmetical operations for the beginner. Succeeding chapters deal with the handling of trigonometrical relations and other more complex operations. The logarithmic basis of the functioning of the slide rule is explained for those who are interested.

Studies in Arc Welding. Published by the James F. Lincoln Arc Welding Foundation, Cleveland (Ohio), 1943. 1295 pp., illus., tables, diagrs., charts, 9 × 6 in., semi-flexible simulated leather, \$1.50 (\$2 outside the United States).

The 98 outstanding papers on arc welding—submitted by engineers and technicians in the James F. Lincoln Arc Welding Foundation's 1940–1942 Industrial Progress Award Program—have been edited and published in a comprehensive collection of design studies on arc welding. Most of the papers are reproduced in complete form, as regards both text and illustrations.

Structural Frameworks. By C. T. Morris and S. T. Carpenter. John Wiley & Sons, New York; Chapman & Hall, London, 1943. 272 pp., illus., diagrs., charts, tables, 9 × $5\frac{1}{2}$ in., cloth, \$4.

This book, which is intended for advanced students, is concerned with the analysis of some complex problems that arise in the design of buildings and structural frameworks, including industrial buildings and radio and transmission towers. Numerous examples are worked out to illustrate the methods used.

Treatment of Experimental Data. By A. G. Worthing and J. Geffner. John Wiley & Sons, New York; Chapman & Hall, London, 1943. 342 pp., illus., diagrs., charts, tables, $9\frac{1}{2}$ × 6 in., cloth, \$4.50.

As an aid to scientists and engineers in presenting experimental data clearly and usefully, this book presents and discusses the following topics: Rules for graphing; methods of smoothing and tabulating; a moderately extended treatment of precision indexes; the essentials of correlation; Fourier series and harmonic analysis as a means of representing data; and the use of determinants as a means of simplifying computations.

Universal Atlas Handbook of Concrete Construction, 8 ed. Published by the Universal Atlas Cement Company, New York (135 East 42d Street), 1943. 274 pp., illus., tables, diagrs., charts, 7 × $4\frac{1}{2}$ in., paper.

Written from a practical rather than a technical standpoint, this volume provides in convenient form, useful information on concrete—both plain and reinforced. It includes sections on concrete made with standard portland cement; with high early strength portland cement; with white portland cement; with special cement for refractory, insulating, and corrosion-resistant concrete; and with special cement for oil-well cementing.

Wissenschaftliche Abhandlungen der Deutschen Materialprüfungsanstalten, II Folge, Heft 4. Neuere Untersuchungen an Baustoffen und Bauteilen. Springer-Verlag, Berlin, 1942. 108 pp., illus., diagrs., charts, tables, 12 × 8 in., paper, 19.60 rm.

This publication of the German materials-testing laboratory contains fourteen papers describing the results of recent investigations of building materials and structural members. The papers deal chiefly with walls and columns, and the materials that are used in their construction. International specifications for sieves are discussed in the final paper.

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Abstracts of Articles on Civil Engineering Subjects from Publications (Except Those of the American Society of Civil Engineers) in this Country and Foreign Lands

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ROADS AND STREETS

Macadam. Monografia del Macadam-Cemento, A. Claussen Durao. *IV Congreso Panamericano de Carreteras—Memoria*, vol. 2, 1942, pp. 30–77. Monograph on cement-bound macadam; theory; different types; origin, history, and different countries where used; description of various construction methods; "sandwich" type prevails in Europe, particularly in Germany; results obtained; test data; discussion of cement macadam in recent International Road Congresses; specifications for penetration type; cost analysis of equipment and labor.

Maintenance and Repair. Aids to New England Towns. *Better Roads*, vol. 13, no. 6, June 1943, pp. 16–18, 28. Town is local road administrative unit in New England; state assistance to town road improvement takes varied forms; brief generalized description of state town highway relationships in each of New England states.

Maintenance and Repair. No substitute for Men, R. M. Whitton. *Better Roads*, vol. 13, no. 6, June 1943, pp. 12–15, 21–22. War manpower crisis has created serious problems for maintenance organizations; patrolmen who have developed skills over period of years cannot be replaced easily; article stresses importance of properly trained personnel for highway maintenance work; experiences of Missouri State Highway Dept., with reference to highway maintenance, are cited.

Mountainous. Derrumbamientos, Deslizamientos y Torrentes en Caminos de Montana de la Republic Argentina, E. Kittl. *IV Congreso Panamericano de Carreteras—Memorial*, vol. 2, 1942, pp. 495–597. Landslides, landslips, and torrential floods on mountain roads in Argentine Republic; these manifestations of dynamic geology constitute definite hazards to roads and railroads; general discussion of soil mechanics; description of specific examples.

Subsoils. Importancia de la Investigacion del Material Tierra en la Construccion Vial, J. I. Planas. *Sociedad Cubana de Ingenieros—Revista*, vol. 38, no. 3, May 1943, pp. 423–446. Importance of investigation of soils in road construction; factors to be considered are type of road surface to be used, thickness of rigid pavement, thickness of subgrade base of flexible pavement, and type and quantity of stabilizers for projects of soil stabilization; factors influencing elimination of defects in road.

Transportation, Africa. Trans-African Communications. *Ry. Gaz.*, vol. 79, no. 23, June 4, 1943, pp. 558–559. Brief description; chain of sea, rail, river, and road links provides connection between West Coast of Africa and Egypt; outline map of Central Africa, showing Trans-African lines of communication, given.

SEWERAGE AND SEWAGE DISPOSAL

Camps, Military. Army Post XVII (Half Year Ended June 30, 1942), J. T. Franks. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 554–563. Description of work on enlargement of plant commenced on October 28, 1941, and completed and put into operation on January 17, 1942; enlargement consisted of grease and grit chamber, additional bar screen, final filter and clarifier, and additional chlorinating basin.

Camps, Military. Improvised Sewage Treatment at Army Camp, H. F. Porter. *Pub. Works*, vol. 74, no. 6, June 1943, pp. 14–17, 52. How bio-filtration plant at army camp for 30,000 men was put into partial operation months before it was possible to complete it; ingenious use of temporary devices minimized use of critical materials.

Grease Recovery. Grease Extraction from Sewage and Sludge, R. Eliassen and H. B. Schulhoff. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 491–498. In order to decrease possibilities for error in transfer from evaporating dish to thimble and to assure more readily extractable sample, experimental work was undertaken; object was to develop method utilizing basic principles of petroleum ether extractions but eliminating sources of error noted above. Bibliography.

Industrial Wastes. Industrial Waste Pre-Treatment at Fort Worth, Texas, W. S. Mahlie. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 521–524. Discussion deals with packing-house waste, since that is major industrial waste received at Fort Worth sewage treatment works.

Industrial Wastes. Sanitary Sewage Flows from Industrial Plants, R. S. Smith and W. W. Walker. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 525–530. Data on variations in volume of flow and chemical characteristics of sanitary sewage from large industrial plant operating three shifts a day; sanitary sewage flows from small arms ammunition plant employing over 6,000 persons; data are presented as additional example of volume and character of sanitary sewage that may be anticipated from such projects.

Industrial Wastes. Screening, Solution of Troublesome Trade Waste Problem, A. L. Boley. *Pub. Works*, vol. 74, no. 8, Aug. 1943, pp. 20–21, 26. By constructing screening plant at tannery and removing large part of hair and lime in tannery waste, troubles at sewage treatment plant of Sheboygan, Wis., were greatly reduced; details of sewage-screening plant.

Industrial Wastes. Treatment of Supernatant Digester Liquor, W. Rudolfs and L. L. Faulk. *Pub. Works*, vol. 74, no. 8, Aug. 1943, pp. 13–15. Treatment with ferric chloride and lime gives best results; optimum quantities of lime and ferric chloride required; type of lime to be used; method of application; results recorded.

Manholes, Covers. Metal Manhole Covers Replaced with Timber or Concrete. *Eng. News-Rec.*, vol. 131, no. 3, July 15, 1943, pp. 156–157. Timber manhole covers as substitute for cast iron are being used in extensions of Los Angeles County sewers, and Las Vegas, Nev., selected reinforced concrete covers for entire new sewer system; these examples typify manner in which communities are finding means of saving critical materials.

Models. Sewage Plant Operation Taught with Model. *Eng. News-Rec.*, vol. 131, no. 3, July 15, 1943, pp. 146–148. To train engineers and operators in operation of Army sewage treatment plants, Corps of Engineers is using demonstration model that not only shows construction details, but also reveals relationship of all underground piping and facilities; model represents biofiltration type plant and is built to scale of 1/4 in. equal to one foot.

Research. Survey of Sewage Research Projects—1943. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 466–475. As extension of activities of Research Committee, list of titles of research projects and brief description of purpose of work have been collected in effort to aid research workers in appraisal of their own problems, to indicate type and scope of work in progress, and to stimulate thought and effort in field.

San Diego, Calif. Solving Boom Town San Diego's Sewage Problem, B. D. Phelps. *Pub. Works*, vol. 74, no. 7, July 1943, pp. 14–19. Article describes how 11.5 miles of interceptor sewer were laid in difficult ground and through tunnels, and treatment plant constructed with foundations 24 ft below sea level, to provide for 125% increase in population.

Sanitary Engineering, Postwar. Postwar Role of Sanitary Engineer, A. Wolman. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 445–452. Public works needs; international aspects; expanded horizons for engineers.

Sewage Analysis, Grease Determination. Grease in Sewage, Sludge and Scum—IV, H. Heukelekian. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 499–511. Transformation of grease in activated sludge.

Sewage Bacteriology. Cultural Characteristics of Zooglea-Forming Bacteria Isolated from Activated Sludge and Trickling Filters, E. Wattie. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 476–490. Predominant bacteria of activated sludge and of trickling filters have been isolated in pure culture; it would appear that these zoogleal bacteria might be considered in one group; cultures isolated may be divided into nine related groups determined by characteristics given.

Sewage Disposal Plants, Priorities. Important Revisions in Sewage Works Priorities Forthcoming. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 565–572. Simplification of project priorities is receiving consideration; regulations applicable to controlled materials plan.

Sewage Filters. Filter Room Practice Vacuum Filter Economy, C. L. Palmer. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 547–554. Experiments at Detroit sewage disposal plant with methods of placing new filter cloths on vacuum filters and resulting economy described.

Sewage Tanks. Sedimentation of Sewage, R. E. Rostenbach and E. L. Waterman. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 453–465. Analysis of certain forces and factors that affect efficiency of full-sized clarification units; operation of clarifiers at Iowa City Sewage Treatment Plant was investigated for various rates of flow and under conditions of actual operation.

Sewage Tanks, Brick. Brick Arches for Tank Walls, O. Albert. *Eng. News-Rec.*, vol. 131, no. 7, Aug. 12, 1943, pp. 260–262. Army sewage plant structures, circular clarifier, and digester tanks have been built at number of eastern camps, using walls made up of series of brick arches; to date, 16 brick tanks have been constructed, varying in diameter from 50 to 70 ft and in height from 8 to 18 ft; it is estimated that use of brick arch-wall design on these structures has resulted in saving of 100 tons of steel.

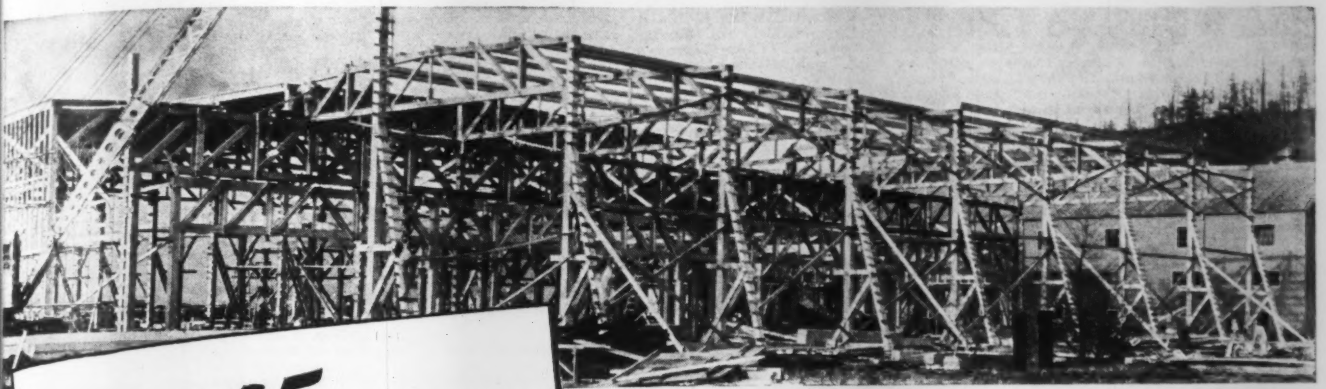
Spartanburg, S.C. Enlargement of Disposal Plant of Spartanburg, S.C., G. W. White. *Water Works & Sewerage*, vol. 90, no. 7, July 1943, pp. 241–245. Additions constitute auxiliary plant operating in parallel with original to provide necessary treatment of Camp Croft sewage; details of plant and equipment given.

Water Pollution. Mathematical Formulation of Oxygen Sag, W. E. Howland. *Sewage Works J.*, vol. 15, no. 3, May 1943, pp. 512–520. Analysis of method of H. W. Streeter; author proposes one small change to make formula slightly more general in application and shows how graphical method already partly developed may be employed to facilitate use of equation; other applications suggested. Bibliography.

STRUCTURAL ENGINEERING

Beams and Girders, Welded Steel. Arc-Welded T-Beams for Use in Residences, E. J. Slygh. *Western Soc. Engrs.—J.*, vol. 48, no. 2, June 1943, pp. 59–67. In scanning through advantages that accrue from use of simple arc welding of beams in house construction, it is seen that arc welding not only conserves national resources and affords labor more employment, but it also provides better construction at less cost.

Columns, Concrete, Designs. Ultimate Strength Formulae for Concrete Columns, J. S. Berry. *Civ. Eng.* (London), vol. 38, no. 443, May 1943, pp. 103–104. Rational column formula covering both axially and eccentrically loaded member; method is advanced as being applicable to calculation of ultimate strength of majority of practical columns.



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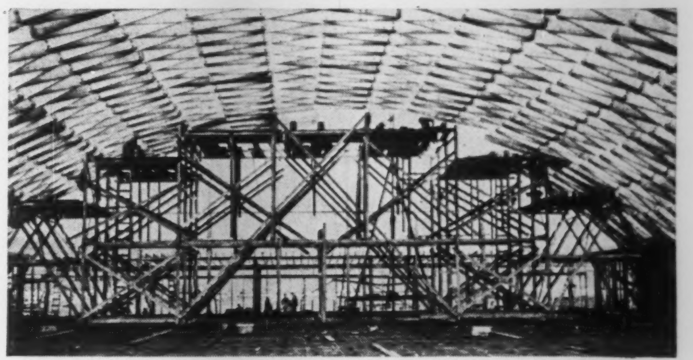

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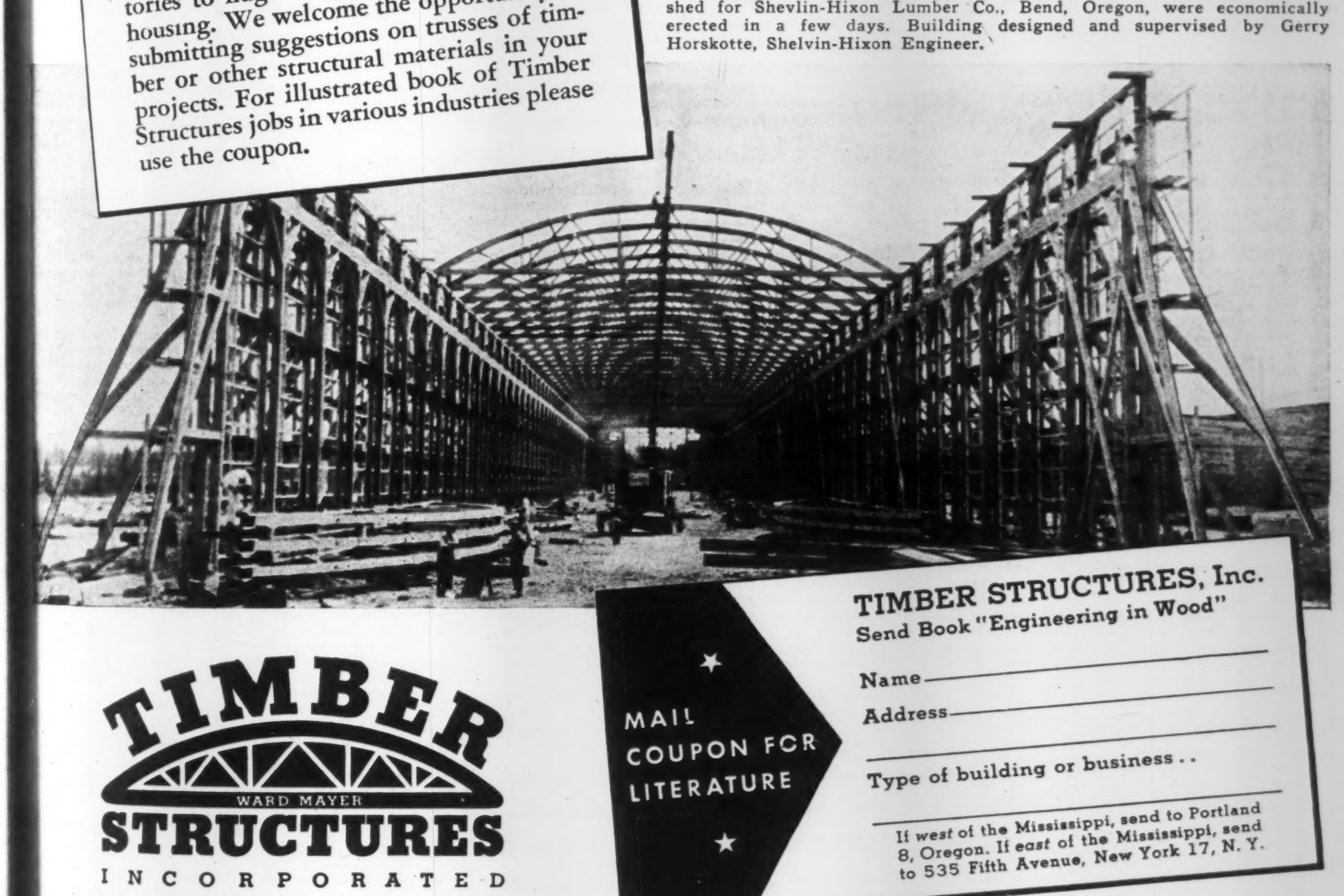

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CONSTRUCTION, FORMS. Future Construction Using Moving Forms, L. E. Hunter. *Civ. Eng.* (London), vol. 38, nos. 443, 444, May 1943, pp. 105–107, June, pp. 126–129. Purpose of this article is to describe briefly outlines of possible future applications of moving form construction, bearing in mind present uses and means of extension of them to other types of structures.

FLOORS, ASPHALT. War Increases Use of Asphalt Flooring, H. K. Sharp. *Petroleum Engr.*, vol. 14, no. 12, Aug. 1943, p. 132. Brief illustrated description of asphaltic composition floor material that provides tough and durable surface, and also has tendency to remain resilient under traffic; other advantages.

ROOF TRUSSES, WOODEN. Job-Made Trackle Lifts Heavy Trusses, J. D. Watson. *Eng. News-Rec.*, vol. 131, no. 3, July 15, 1943, pp. 144–145. Using job-made capstans and four 55-ft timber gin poles, it was possible to raise into position 22-ton timber trusses for airplane hangar; trusses were prefabricated at central yard; crew of 20 carpenters and 30 laborers reassembled and raised one truss during each 10-hour shift; actual raising operations required only 30 min.

SHIPBUILDING, WELDING. Fractures in Welded Ships, J. Tutin. *Shipbldr. & Mar. Engine-Bldr.*, vol. 50, no. 411, Aug. 1943, pp. 263-264. Observations on locked-up stresses in welded ships with particular reference to failure of tanker "Schenectady"; author claims that locked-up stress in welded deck can be prevented by introduction of transverse line or lines of rivets, and similarly in shell, tank top, or double bottom.

WALLS, BRICK. Air Conditioned Aircraft Plant Has Walls That "Breathe" so as to Avoid Condensation Troubles. *Heating, Piping & Air Conditioning*, vol. 15, no. 6, June 1943, pp. 290–291. Construction features of walls of windowless Oklahoma City plant of Douglas Aircraft are illustrated and briefly described; brick wall over 50 ft in height is ventilated through open vertical joints in one course near top and in two courses waist-high near bottom of outer brickwork.

WELDS, STRESSES. Welding Contraction, and "Locked-Up" Stresses. *Metal Progress*, vol. 44, no. 2, Aug. 1943, pp. 249–251. Some fundamental principles of locked-up stresses are discussed with special reference to welded construction in shipbuilding; procedure to minimize residual stresses. Extracts from bulletin issued by British Admiralty.

TRAFFIC CONTROL

TRAFFIC DIVIDERS. Asphaltic Pavement Bars Protect Safety Zones. *Eng. News-Rec.*, vol. 131, no. 3, July 15, 1943, p. 141. Pre-cast asphaltic concrete bars set in pavement surfaces to form ridges that will jolt motorist who drives over them, have been installed at several points in California, notably in San Francisco and Daly City, as protection for safety zones located beside street railway tracks.

TUNNELS

CONSTRUCTION. Three Tunnels Driven by Full-Face Drilling with Detachable Bits. *Construction Methods*, vol. 25, no. 6, June 1943, pp. 52–53, 120–122, 124, 126. Tunnels totaling 20,131 ft in length are part of 70-mile Conchas Irrigation Canal, principal features of U.S. Bureau of Reclamation's Tucumcari Project in Quay County, N.Mex.; tunnels are horseshoe-shaped, 11 ft 6 in. in diameter and concrete lined; notes on construction methods and equipment used.

WATER RESOURCES

WATER SUPPLY, CAMBRIDGE, MASS. Economical Addition to Cambridge, Mass., Supply, T. W. Good. *Am. Water Works Assn.—J.*, vol. 35, no. 8, Aug. 1943, pp. 983–986. Water department of Cambridge increased its supply by 3½ to 5 mgd by pumping from glacial formation underneath one section of Fresh Pond, which is original and main source of supply.

WATER TREATMENT

BUTLER, MO. Fifty-Three Years' Development of Missouri Water Plant, C. W. Miller. *Pub. Works*, vol. 74, no. 8, Aug. 1943, pp. 16–17. Notes on development of Butler, Mo., water plant from simple settling tank and two steam pumps to modern plant with five motor-driven pumps and softening and filtration plant.

CONTROL OF AQUATIC NUISANCES. Control of Micro-Organisms and Aquatic Vegetation, L. F. Warrick. *Water Works & Sewerage*, vol. 90, no. 7, July 1943, pp. 267–272. Control of aquatic nuisances by chemical methods; difficulties created by superabundant growths of algae, rooted weeds, and certain obnoxious growths in lakes and streams; developments in overcoming difficulties; studies carried out by Wisconsin Committee on Chemical Treatment of Lakes and Streams, with attention to methods for more definitely controlling dosages of chemical to prevent unnecessary damage to fish and other aquatic life, particularly fish foods.

EXPERIMENTAL. Experimental Treatment Plant at Miami, A. B. DeWolf. *Am. Water Works Assn.—J.*, vol. 35, no. 8, Aug. 1943, pp. 1085–1089. Main object of pilot plant was to discover and explore new methods of water treatment which could be adapted to existing water supply derived from 15 wells; pilot plant design; experimental work and results to date are reported.

FORSYTH, MONT. How Presedimentation Worked at Forsyth, F. F. Palmer. *Pub. Works*, vol. 74, no. 7, July 1943, pp. 25–26. When filter plant at Forsyth, Mont., aided by chemical treatment, was unable to handle water with 75,000-ppm turbidity and loads of dead algae, presedimentation solved problem economically; manner in which this was accomplished.

QUALITY CONTROL. Supervising Water Quality in Massachusetts, N. N. Wolpert. *Water Works Eng.*, vol. 9 , no. 15, July 28, 1943, pp. 828–830, 850–851. Extent and character of supervision and checking of public water supplies by Massachusetts State Dept. of Pub. Health described; how war has affected this activity is outlined; detailed presentation is given of equipment and methods used in sending out, filling, and returning water sample bottles that are to be examined at laboratory; how ammonia-free water is produced in laboratory is described.

REDUCING HARDNESS. Biological Water Conditioning, H. C. Myers. *Water Works & Sewerage*, vol. 90, no. 5, May 1943, pp. 185–186. Some observations in Judson Reservoir, Southern California; paper points out remarkable reduction in hardness of water due to growth of Chara and shows that this aquatic plant has inhibiting effect upon algae, due to its ability to utilize bicarbonates of calcium and magnesium as source of carbon in process of photosynthesis.

WATER ANALYSIS. Sampling Errors in Water and Sewage Plant Data, H. A. Thomas, Jr. *Water Works & Sewerage*, vol. 90, no. 5, May 1943, pp. 182–184. Brief description of modern concept of small sample; its application to analyses of water and sewage plant data.

WATER BACTERIOLOGY. Collecting Water Sample for Bacteriological Analysis. *Water Works Eng.*, vol. 96, no. 15, July 28, 1943, p. 833. South Dakota State Dept. of Health gives procedure to avoid contamination when taking sample for laboratory test.

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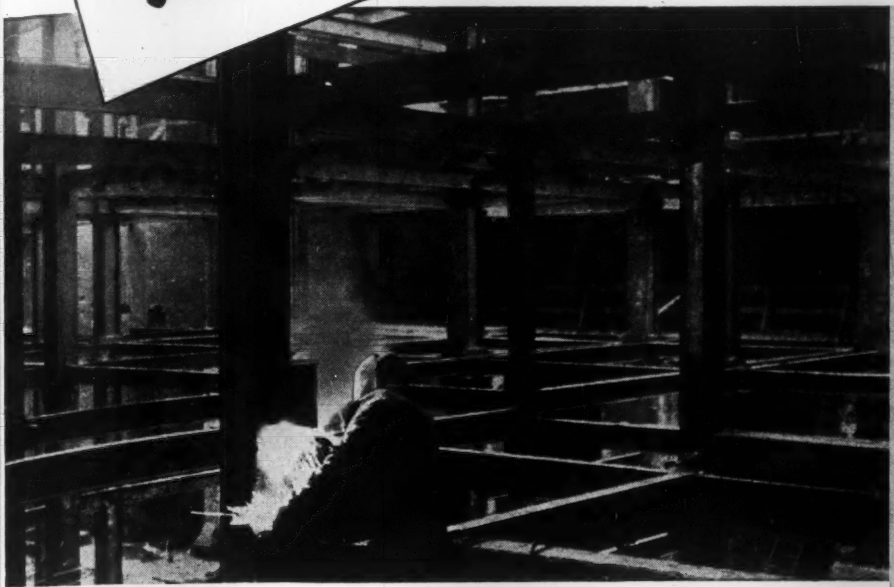

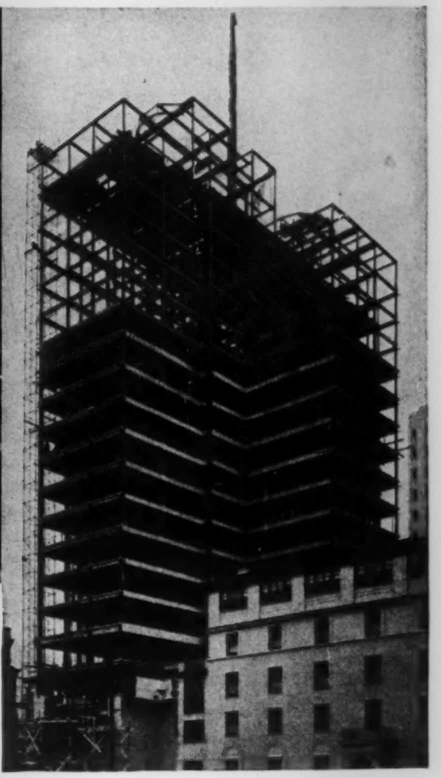

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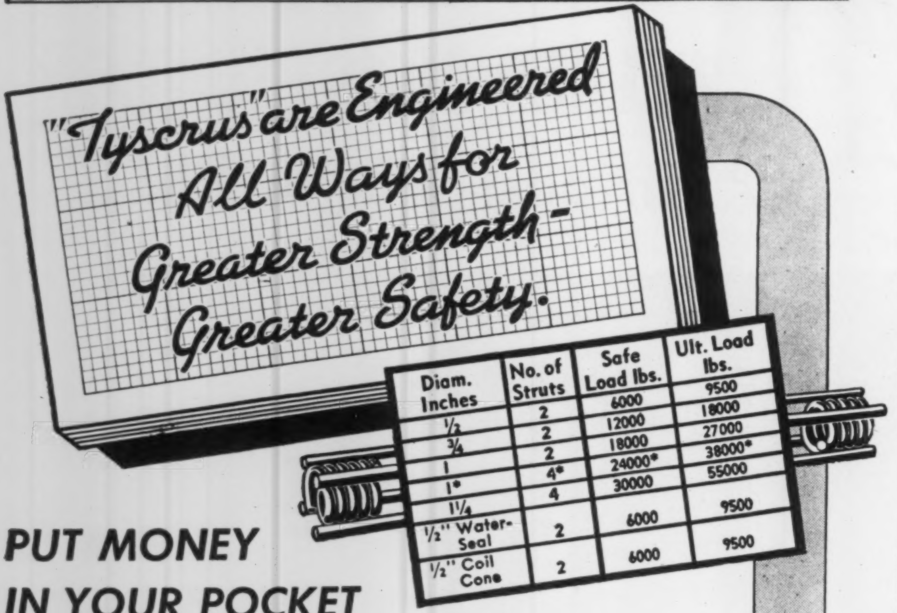
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WATER WORKS ENGINEERING

CAMPS, MILITARY. Water Supply Practice in Army Training Centers, L. H. Kessler, V. B. Sundstrom, and A. O. Tomek. *Am. Water Works Assn.—J.*, vol. 35, no. 8, Aug. 1943, pp. 1009–1050. Comprehensive report based on experience with various types and practices in water supply systems at army camps; design of units, distribution systems, plant operation, personnel, metering practice, chlorination, and scale and corrosion problems are discussed.

KANSAS CITY, MO. Kansas City Improvements Meet Wartime Conditions, K. K. King. *Am. Water Works Assn.—J.*, vol. 35, no. 8, Aug. 1943, pp. 987–992. Description of size and general scheme of water system serving population of 525,000; improvements in treatment works; only improvement adding materially to operating costs has been softening of water, but total operating costs remain far below years previous to 1940; details of meter checking program; new collection accounting system.

KANSAS CITY, MO. Kansas City Water Improvements Meet Wartime Conditions, K. K. King. *Water Works & Sewerage*, vol. 90, no. 8, Aug. 1943, pp. 287–289. Paper on improvements in Kansas City Water Dept. since spring of 1940, including water-softening facilities, economies in expenditures, in metering, installation of new accounting and collection system. Before Am. Water Works Assn.

MANAGEMENT. Ontario Practice in Commission Controlled Water Department Operation, W. Storrie. *Eng. & Contract Rec.*, vol. 56, no. 34, Aug. 25, 1943, pp. 20–21, 27. Formation and powers of commission; annual statement to council; revenue to be paid to municipal treasurer; establishment of municipal water works; power to supply water outside of municipality; surplus funds; city of Belleville case. Before Am. Water Works Assn.

MATERIALS CONSERVATION. Administrative Policies of Water Division—Office of War Utilities, A. E. Gorman. *Am. Water Works Assn.—J.*, vol. 35, no. 7, July 1943, pp. 846–852. Administrative aspects in carrying out water works wartime policies dealing with maintenance of adequate supply and service, procurement of materials, and allocations of materials under controlled-materials plan.

MATERIALS CONSERVATION. Plans and Policies of Office of War Utilities, J. A. Krug. *Am. Water Works Assn.—J.*, vol. 35, no. 7, July 1943, pp. 841–845. Outline of program by which water utilities can cooperate in war effort through minimum usage of strategic materials.

MATERIALS CONSERVATION. Administrative Policies of Water Division—Office of War Utilities, A. E. Gorman. *Am. Water Works Assn.—J.*, vol. 35, no. 7, July 1943, pp. 846–852. Deals with following points: War demands on water supply have created deficiencies; adequacy of supply; maintenance of service necessary at all points; procurement of materials; Controlled Materials Plan; program for cooperation.

MATERIALS CONSERVATION. Plans and Policies of Office of War Utilities, J. A. Krug. *Am. Water Works Assn.—J.*, vol. 35, no. 7, July 1943, pp. 841–845. Suggest broad policies to be pursued by water supply industry in interests of conservation of critical materials.

POSTWAR. Postwar Water Works Materials, W. V. Weir. *Am. Water Works Assn.—J.*, vol. 35, no. 8, Aug. 1943, pp. 1051–1057. Consensus of opinion of manufacturers of water works equipment and materials indicates postwar outlook; there does not seem to be indication of radical departure from old designs or from use of standard purification and operating materials; plastics predominate as new material; electronic control will find greater use in measurement and control.

POSTWAR. Postwar Water Works to Cost $220,000,000 Annually, A. Wolman. *Water Works Eng.*, vol. 96, no. 14, July 14, 1943, pp. 790–792. Water works construction, for first postwar decade, is estimated to average annually $220,000,000; what is needed must be appraised locally, and action should not be deferred while waiting for federal money; authorization of projects and preparation of detailed plans and specifications are urged; advice is given to avoid delay while waiting developments of new materials; to see that all legal obstacles are cleared; and to disregard political boundaries in extending water service.

POSTWAR. Relation of Public Water Supply to Postwar Program, W. Chevalier and A. Wolman. *Am. Water Works Assn.—J.*, vol. 35, no. 7, July 1943, pp. 853–868. Discussion dealing with influence of postwar planning upon public works programs in general and water works in particular.

WATER METERS, WAR CONDITIONS. How Meter Division Met Wartime Emergency Conditions in Elgin, L. Trentlage. *Am. Water Works Assn.—J.*, vol. 35, no. 8, Aug. 1943, pp. 1002–1024. Details of means whereby Water Meter Division at Elgin, Ill., contributed to war cause by direct saving in fuels and critical materials; 100% elimination of meter reading "pick-ups"; development of rattle barrel to clean meter boxes; grinding-in measuring chambers and disk pistons.

WASTE SURVEYS. Water Saving Survey in Allentown, Pa., W. R. Schnabel. *Am. Water Works Assn.—J.*, vol. 35, no. 8, Aug. 1943, pp. 993–998. Details of survey conducted in 1942 which included tests for leakage of entire distribution system, tests of all 4-in. and larger meters in place, tests of flow of gravity spring water line, 26,000 ft in length, and test of all pumps for slip and efficiency; results of survey recorded and savings shown.

WATER TANKS AND TOWERS, WOODEN. Wood Stave Tank on Timber Tower. *Eng. News-Rec.*, vol. 131, no. 3, July 15, 1943, pp. 157–158. To avoid use of critical materials and, at same time, to meet requirements for water capacity and pressure at large army camp, water tank was built which considerably exceeds standard practice both in height of supporting timber tower and in size of elevated wood-stave tank itself; tank capacity is 300,000 gal.

WATER WELLS. Redeveloping Well Yield, A. D. Henderson. *Water Works Eng.*, vol. 96, no. 16, Aug. 11, 1943, pp. 882–886. Rehabilitation of nine well stations on Long Island, New York; description of wells; tests for capacity; development by compressed air, surge pumping, and surge blocks; comparisons of methods.

WATER WELLS, JASONVILLE; IND. Well in Mine Furnishes Supply, W. A. Oeffler. *Water Works Eng.*, vol. 96, no. 10, May 19, 1943, pp. 484–487. Special treatment required for mine drainage water used by Jasonville, Ind.; description of water treatment; 6-in. deep-well Pomona turbine pump with 15-hp, 220-v, 60-cycle, 3-phase Westinghouse vertical motor was installed, having capacity of 315 gal per min at total head of 90 ft, impeller setting of 57 ft, pumping being controlled by float switch on wall of settling basin.

WATER WORKS, PROTECTION. Effects of War Gases on Water Supplies: Decontamination, H. H. Potter. *New England Water Works Assn.—J.*, vol. 57, no. 2, June 1943, pp. 137–162. Physical and physiopathological effects of various chemical agents considered and actual effects of these agents on water supplies; danger is considered most unlikely, but author stresses need of thorough knowledge of decontamination practices.

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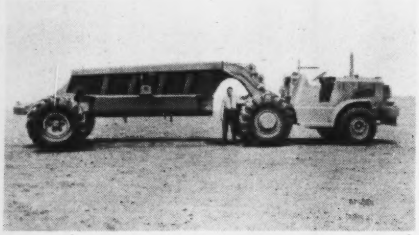

The new units are the Heil Trailbuilder and the Heil Bottom-Dump Trailer Wagon. The wagon and its heavy-duty wheel tractor is 36 ft long, weighs 34,000 lbs, and is capable of hauling a load of 25 tons. The "bottom dump" system on the Heil wagon is new. On bottom dump wagons in general, the dump doors swing down. This reduces ground clearance and often makes it difficult for the vehicle to climb through and over the load it has just dumped. The new clamshell type bottom dump doors swing up alongside the hopper. The doors, operated by a power-driven cable, open in two seconds and when open give the vehicle more clearance than before it dumped. The doors close by gravity and lock when back in position.

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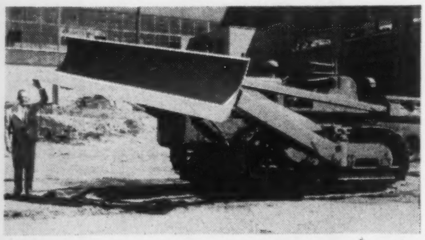

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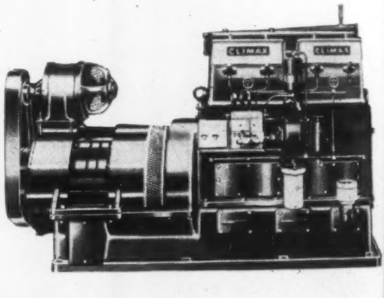

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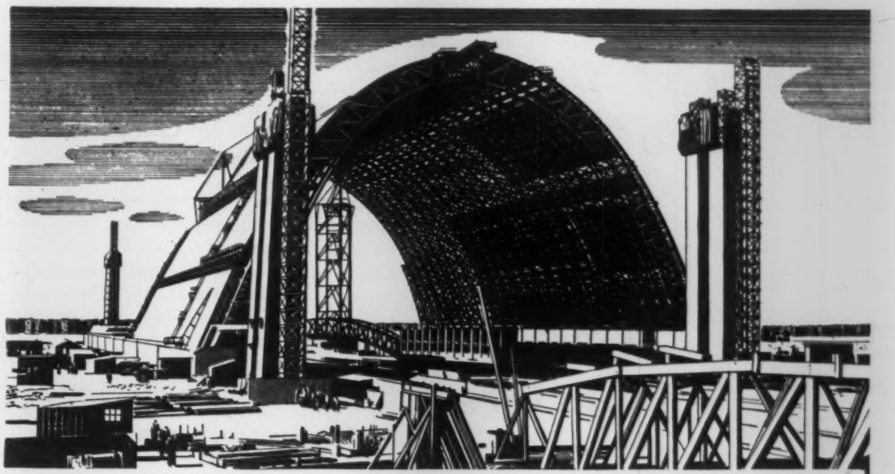

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The instruments are reported to have a sensitivity of one part in 8,000, and an accuracy of plus or minus 0.1%. A pointer, moving over a mirrored 5-in. dial, makes practically two revolutions in traversing the full scale-range. This is equivalent to a linear scale of approximately 29 in., and permits readings to one-foot altitude or 0.05-millibar pressure.

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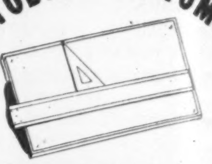

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"R" Monel, "K" Monel
"H" Monel, "S" Monel
Nickel (pure, wrought and cast)
"D" Nickel, "Z" Nickel
Inconel (wrought and cast)
Hastelloy A, B, C, D
Illium G, R
Alcoa 2S, 3S, 17S, 52S, 53S
Alclad 24S
Alcoa 13, 43, 195, 214, 220
Copper
Red Brass (wrought and cast)
Yellow Brass (high brass)
Naval Brass (Tobin bronze)
Admiralty Brass
Muntz Metal
Manganese Bronze
Silicon Bronze
Phosphor Bronze 5%
Aluminum Bronze
Beryllium Copper
Nickel Bronze (cast)
Nickel Silver 20% (cast)
Nickel Silver 18% (wrought), 13% (cast), 10% (wrought)
Ambrac 20%
Cupro-Nickel 70-30, 55-45
Tin
Chemical Lead
Antimonial Lead
Tellurium Lead
Soft Solder 50-50, 60-40
Zinc
Zilloy 15, 40
Dow Metal E, H, R, X
Silver (pure)
R-T Silver Brazing Alloy
Easy-Flo Silver Brazing Alloy
Gold (pure)
Platinum (pure and commercial)
Iridium-Platinum 10%
Rhodium-Platinum 10%
Palladium (commercial and hard)
Tantalum
Iron (wrought, ingot and cast)
Ni-Tensyliron +
Ni-Resist (standard and copper-free)
Ni-Hard, low carbon, high carbon
Carbon Steel (SAE 1020)
Cast Carbon Steel
Cast Alloy Steel
Stainless Steel 304, 309, 310, 316, 321, 347, 325, 410, 420, 430, 446, 312, 330
Cast 18 Cr 8 Ni Steel
Cast 18 Cr 8 Ni 3 Mo. Steel
Invar
Cast 28 Cr 10 Ni Alloy
Cast 35 Ni 15 Cr Alloy
60 Ni 15 Cr Alloy (wrought and cast)
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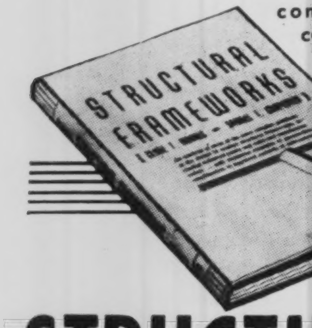

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New literature describes the material and methods of application.

Literature Available

BRIDGES—"Planning of Small Bridges" is the title of a booklet recently issued by the Republic Steel Corporation, Sheet & Strip Steel Sales Div., Cleveland, Ohio. With its companion volume, "Manual of Instructions for Inspection and Rating of Bridges," this booklet suggests the current planning of the repair or replacement of small bridges as an important feature of postwar construction planning. Both booklets are available to engineers.

BUCKETS—The Hayward Company, 50 Church St., New York 7, N.Y., announce the publication of three new booklets on the care of Hayward Orange Peel, Clam Shell, and Electric Motor Buckets. Although these wartime guides are particularly intended for users of Hayward products, they contain timely information and suggestions of value in the proper care and maintenance of practically any bucket.

CHEMICAL FEED CONTROL—The "Var-I-Feeder," developed by Chem-Feeds-Inc., 77 Reservoir Ave., Providence, R.I., is described, illustrated and blue-printed in Bulletin No. 77.

COUPLINGS AND FITTINGS—A combination of catalog and engineering manual has been prepared for early distribution by the Victaulic Co. of America, 30 Rockefeller Plaza, New York 20, N.Y. The new handbook is a comprehensive listing of flexible couplings and fittings for use with grooved pipe, as well as a guide to their use in industrial, mining, petroleum, shipbuilding, and water works and sewerage fields. The engineering and catalog material has been tabulated by industries to facilitate its quick and easy use.

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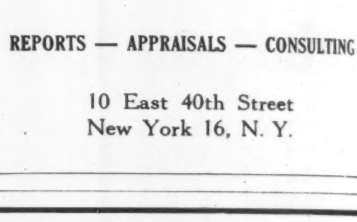

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Flowmeters—"How to Keep Flowmeters Accurate" is a practical guide to accurate metering—an 8-page manual on how to install them correctly and keep them accurate. With no waste words, it tells how to prevent and cure meter ills to the end that the flow charts of America's central stations, institutions, and industrial plants may do a 100% job for to-day's war and to-morrow's peace. Cochrane Corporation, 17th and Allegheny Ave., Philadelphia 32, Penna.

Glues—New uses for synthetic resin glue as a vital war material are described in "Laucks Synthetic Resin Glues Go to War," published especially for builders, contractors, architects, engineers, by I. F. Laucks, Inc., Maritime Bldg., Seattle 4, Wash. This 20-page illustrated brochure shows how waterproof glues are used in the construction of wood-and-glue airplanes, ships, defense homes and buildings, arches and beams and also smaller items. All types of the Laucks line of glues, which meet government specifications, are described—phenol resins, urea resins, melamine resins, casein, casein-soybean, and soybean glues.

Lindsay Structures—A new 40-page Lindsay Structure Manual has just been published by Lindsay and Lindsay, 222 W. Adams St., Chicago 6, Ill. Lindsay Structure is a strong light-steel prefabricated construction that can be assembled with simple wrenches. It is suitable for cabinets, machine housings, refrigerator units, processing rooms, industrial buildings, truck bodies, and other structures.

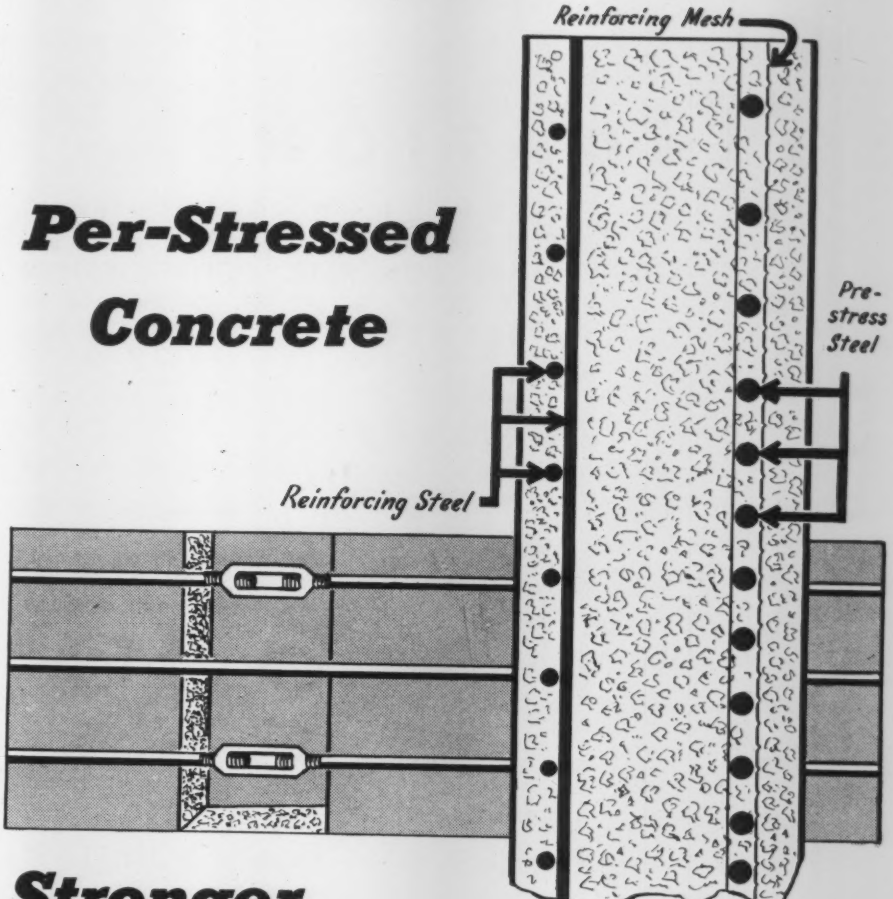
Locomotives—Designed for use in operations where gas exists in explosive quantities or mixtures, explosion-tested locomotives available in a range of sizes suitable for operation on track gages from 36 to $56^1/_2$ in. and for 250 volts or 500 volts direct current are described in a new booklet announced by Westinghouse Electric and Mfg. Co., Dept. 7-N-20, East Pittsburgh, Penna.

Lubrication—A 64-page, durably bound book presents a very thorough manual on the lubrication and maintenance of construction equipment. It is very property entitled, "Lubrication and Maintenance Guide for Contractors' Equipment." Gulf Oil Corporation, Gulf Building, Pittsburgh, Penna.

Motor Buying—New simplified buying data in bound and loose-leaf form for quicker selection, easier ordering and quicker delivery, may be obtained from the district offices of Westinghouse Electric & Mfg. Co. The books contain prices, dimensions, application data and descriptions. The 180-page "Motor Buying Data" covers popular types and ratings of motors (up to 100 hp), gear-motors, and M-G sets. "Control Buying Data" (276 pages) lists a wide variety of controls and accessories for d-c, single-phase, squirrel cage and wound rotor motors.

Paints—Valdura Heavy Duty Industrial Maintenance Paints are now listed in the new catalog just issued by the American-Marietta Company, 43 East Ohio St., Chicago, Ill. Fully illustrated, the catalog provides application suggestions, product descriptions and technical data.

Per-Stressed Concrete



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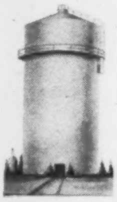

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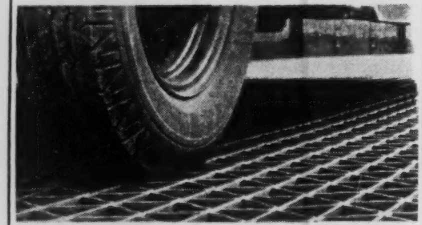

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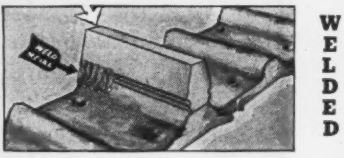

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PUMPS—"Handbook for Wartime Care of Centrifugal Pumps," Allis-Chalmers' new maintenance guide, makes specific recommendations for putting pump care on a wartime basis. Step by step a centrifugal pump is actually built, and as each part is added, the way it is built and functions are seen to determine the way it should be cared for. The new manual applies to all makes of pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

PUMPS—The Westco Industrial Pumps Catalog No. 43, sixty pages, liberally illustrated, with list of applications, specifications, and performance tables, is ready for distribution by Pomona Pump Co. Division of Joshua Hendy Iron Works, 206 East Commercial St., Pomona, Calif.

SAFETY—"The Austin Safety Method" is the title of a booklet just published for construction superintendents, foremen, safety engineers, and such key men, by The Austin Co., Cleveland, Ohio.

TRACTORS—An intriguing word-and-picture story as to how "Caterpillar" products of peace became tools of war almost over night is told in a new booklet, "War and Peace," Form 7993, published by Caterpillar Tractor Co., Peoria, Ill.

WATER PRODUCTION FOR INDUSTRIAL AND MUNICIPAL USE—names and practically describes a recent booklet of the Ranney Water Collector Corp., New York, N.Y. In addition to dealing with the general problem of industrial and municipal water supply, it sets forth in detail the advantages of the Ranney System, and includes complete engineering sketches and photographs.

WOOD PIPE—Chock-full of drawings and "how to" information for engineers and contractors, a new 16-page bulletin entitled "Redwood Pipe" is now being distributed by the California Redwood Association. By means of tables, text and drawings, the bulletin deals with the problem of installation of four types of redwood pipe: continuous stave pipe, machine banded pipe, bored pipe, and redwood lined metal pipe. California Redwood Association, 405 Montgomery St., San Francisco, Calif.

WROUGHT IRON PIPE—A colorful and easy-to-read technical bulletin entitled "Wrought Iron for Underground Services" has been released by the A. M. Byers Co., Pittsburgh, Penna. It discusses important factors affecting soil corrosion of underground piping, weighs theory against test results, and outlines installation histories of water wells, and lines, gasoline lines and tanks, and electrical cable conduit.

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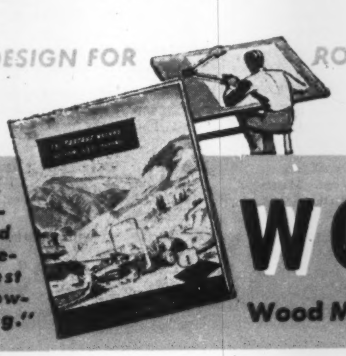

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Additions, Transfers, Reinstatements, and Resignations

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Additions to Membership

Adams, James William (Jun. '43), Junior Naval Archt., U.S.N., 2620 Winslow Drive, N.E., Atlanta, Ga.

Adams, William Pearson (Jun. '43), Ensign, U.S.N.R., 300 South Atherton, State College, Pa.

Adey, Edward Alonzo, III (Jun. '43), Ensign, U.S.N.R., 309 Millaudon St., New Orleans 18, La.

Alatsas, James George (Jun. '43), Stress Analyst (Aeronautical), Gen. Motors' Eastern Aircraft Div., Product Eng., Dept. 99, Linden, N.J. (Res., 331 East 16th St., New York 3, N.Y.)

Austin, John Maynard (Jun. '43), With U.S.N., Vernon St., Bethel, Me.

Barrett, Willis Chapel (M. '43), Hydr. Eng. Specialist, Cultural Relations Div., State Dept., Washington, D.C. (Res., 827 West Burkett St., Sheridan, Wyo.)

Bassford, Henry Hall (M. '43), Dist. Building Constr. Supt., Panair-Airport Development Program, Army Post Office 603, Care, Postmaster, Miami, Fla.

Bederman, Nathan Berwin (Affiliate '43), Comdr., U.S.N., Fleet Post Office, San Francisco, Calif.

Bell, William Eugene (Jun. '43), Lt., Field Artillery, U.S. Army, 418 Johnson, Little Rock, Ark.

Bergman, Charles Stephen (Jun. '43), Ensign, U.S.N.R., 156 Primrose Rd., Williston Park, N.Y.

Beverage, Arthur Walter, Jr. (Jun. '43), Junior Engr., Curtiss-Wright Corp., Buffalo (Res., 5801 Main St., Williamsville), N.Y.

Bishop, James Ketchel (Jun. '43), Asst. Engr., Dravo Corp., Neville Island 25, Pittsburgh 25, Pa. (Res., Branson, Mo.)

Black, Charles Howard (Assoc. M. '43), Chf. Civ. Engr., Ralph L. Woolpert Co., 132 North Main St., Dayton, Ohio.

Blackwell, Guy Braxton, Jr. (Jun. '43), Ensign, CEC, U.S.N.R., 306 East Moulton St., Decatur, Ala.

Borgwald, Carl Ray (Jun. '43), 2d Lt., U.S. M.C.R., 2451 North Cheyenne, Tulsa 6, Okla.

Bradberry, Carroll Earl (Jun. '43), Junior Engr., Standard Oil Co. of California, El Segundo (Res., 924 South Ridgeley Drive, Los Angeles 36), Calif.

Brantly, John Edward, Jr. (Jun. '43), Private, U.S. Army, Cocoa Beach, Fla.

Brasher, Herbert (Jun. '42), Engr., Carl L. Svensen, 1509 Ave. K, Lubbock, Tex.

Burke, Robert Oscar (Jun. '43), Cadet, U.S. Military Academy, Company B-2, West Point N.Y.

Carlson, Carl Elmer (Jun. '43), 2d Lt., Corps of Engrs., U.S. Army, Army Post Office 183, Care, Postmaster, Los Angeles, Calif.

Carstens, Robert Lowell (Jun. '43), Private, Corps of Engrs., U.S. Army, 372 Fifteenth St., S.E., Cedar Rapids, Iowa.

Chavez, Ignacio Paul (Assoc. M. '43), Associate Engr., Federal Power Comm., Phelan Bldg. (Res., 1783 Forty-sixth Ave.), San Francisco 22, Calif.

Christianson, Hilmar Barman, Jr. (Jun. '43), Private, Corps of Engrs., U.S. Army, Officer Candidate Regiment, Fort Belvoir, Va.

Coel, Joseph (Jun. '43), Ensign, U.S.N.R., Naval Training Station, Cornell Univ., 50 Sage Hall, Ithaca, N.Y.

Collins, James Anthony (Jun. '43), Senior Draftsman, Eng. Dept., Celotex Corp., 205 West Monroe St. (Res., 115 East 68th St., Chicago, Ill.

Condon, Joseph Moakley (Jun. '43), Private, U.S. Army, 880 Elm St., New Haven, Conn.

Correll, William Bertie (Jun. '43), 909 West Grace St., Richmond, Va.

Cotter, Thomas John (Jun. '43), Private First Class, U.S. Army, Dow Field, Bangor, Me.

Coulter, David Milton (Jun. '43), Private, U.S. Army, Squadron K, Div. 40, Room 1735, Yale Univ., A.A.F.T.S., New Haven, Conn.

Cox, Dwight Jernigan (Jun. '43), 2d Lt., Ordnance Dept., U.S. Army, Fort Bliss, Tex.

Crowe, Charles Fredric (Jun. '43), Private, U.S. Army, 707 North 19th St., Boise, Idaho.

Croxatto, Carlos (Jun. '43), Design Engr., Corporacion de Fomento de la Produccion, Ramon Nieto 920 (Res., Irarrasaval 4250), Santiago, Chile.

Cullum, Thomas Ashley, Jr. (Jun. '43), 5737 Nash St., Dallas, Tex.

DeLacy, John Richard (Assoc. M. '43), Engr., Head of Structural Design, U.S. Engr. Office, San Juan (Res., $1\frac{1}{2}$ Duarte St., Santurce), Puerto Rico.

Dent, Juan, Jr. (Jun. '43), Firm Engr., Dent e Hijos, Apartado 445, San Jose, Costa Rica.

Dungan, Richard Melburn (Affiliate '43), Pres., B-D-R-Eng. Corp., 1005 Porter Bldg., Kansas City 2, Mo.

Dysart, Charles Eugene (Jun. '43), Corporal, Signal Corps, U.S. Army, Route 4, Marion, N.C.

Edwards, Percy Anway (M. '43), Structural Engr., Montgomery Ward & Co., Section 2–5, South Bldg. 619 (Res., 2315 West 113th Pl.), Chicago, Ill.

Edwards, Robert Josiah (Assoc. M. '43), Cuyahoga County Engrs., 1900 Standard Bldg., Cleveland (Res., Richmond Rd., Bedford), Ohio.

Ellis, Donald Thomas (Jun. '43), Ensign, A-V (S), U.S.N.R. 4139 Burnham Ave., Toledo, Ohio.

Francis, Hines Kennon (Assoc. M. '43), Associate Civ. Engr., State Planning Board, 711 Highway St., Room 304, Montgomery 5, Ala.

Frank, Warren Settle (Jun. '43), 2d Lt., Officers Reserve Corps, U.S. Army, 133 South Court St., Luray, Va.

Flook, Lyman Russell, Jr. (Jun. '43), Junior Engr., Bureau of Reclamation, Box 1023, Pueblo, Colo.

Freeman, Verne Davis (Jun. '43), Junior Engr., Standard Oil Co. of California, 265 Bush St. (Res., 346 Portola Ave.), Palo Alto, Calif.

Funk, John Benjamin (Assoc. M. '43), Cons. Engr., H. B. Funk & Co., Box 43, Brunswick, Md.

Gabe, Donald Duane (Jun. '43), 2d Lt., Corps of Engrs., U.S. Army, Taylor, N.Dak.

Geismar, Leo William, Jr. (Jun. '43), With Corps of Engrs., U.S. Army, 77 East 236th St., New York 66, N.Y.

Gish, Ellis Victor (Jun. '43), Stress Analyst, Consolidated Vultee Aircraft Corp., Consolidated Plant (Res., 2726 Merrimac St.), Fort Worth, Tex.

Gonzalez-Angel, Angel Maria (Jun. '43), Junior Engr., U.S. Engr. Dept., Stop $7\frac{1}{2}$, San Juan (Res., 5 Comercio St., Miramar), Puerto Rico.

Greene, Cuvier (Assoc. M. '43), Gen. Supt., Weymouth Crowell Co., 2104 East 15th St. (Res., 8750 El Tovar Pl.), Los Angeles 46, Calif.

Griffin, Alexander John (Assoc. M. '43), Engr., Dunbar & Sullivan Dredging Co., 2312 Buhl Bldg. (Res., 3930 Yorkshire Rd.), Detroit 24, Mich.

Grote, Albert Otto (Jun. '43), Engr. Aid Senior, Kaiser Co., Inc., Yard 3, Machine Shop, Richmond (Res., 835 Santa Barbara Rd., Berkeley 7), Calif.

Guillou, John Carroll (Jun. '43), Graduate Laboratory Asst., College of Eng., Univ. of Southern California, University Park, Los Angeles 7, Calif.

Hewett, Robert Wayne (Jun. '43), Ensign, CEC-V (S), U.S.N.R., U.S. Naval Constr. Training Center, Camp Peary, Va.

Higgins, Ray Edgar (Jun. '43), With Corps of Engrs., U.S. Army, 207 Columbia St., Somerset, Ky.

Hill, Richard Clayton (Jun. '43), Private, U.S.M.C., 121 Fourth Ave., Columbia, Mo.

Hoffman, Vincent Paul (Jun. '43), Specialist, Chicago Bridge and Iron Co., Ft. of Washington St. (Res., 1137 F St.), Eureka, Calif.

Hofmann, Robert (Jun. '43), Eng. Draftsman, Douglas Aircraft Co., Inc., 5651 West Manchester, Inglewood (Res., 933 Ocean Ave., Santa Monica), Calif.

Hood, James Edward (Jun. '43), 1st Lt., Corps of Engrs., U.S. Army, 3309 Runnymeade Pl., N.W., Washington, D.C.

Hopps, John Philip (Assoc. M. '43), Design Draftsman, Utah-Pomeroy-Morrison, Box 197, Provo, Utah.

Hotchkiss, Gerald Richard (Jun. '43), Eng. Draftsman, Eng. Dept., Douglas Aircraft Co., Inc. (Res., 927 Fourteenth St.), Santa Monica, Calif.

Hutchison, Edward Elmore (M. '43), (Punnett, Parez & Hutchison), 58 Sutter St., San Francisco, Calif.

Hyde, Gerald Raymond (Jun. '43), Junior Engr., U.S. Bureau of Reclamation, Dept. of Interior, Customhouse, Room 446, Denver, Colo.

Janes, Robert Lee (Jun. '43), Instr., California Inst. of Technology (Res., 1785 Las Lunas St.), Pasadena, Calif.

Jarnis, John George (Jun. '43), Ensign, U.S. N.R., 29 Warren Ave., Waltham, Mass.

Johann, William Henry, Jr. (Jun. '43), With U.S. Army, 4212 Kensington Ave., Richmond, Va.

Johnson, Donald Leland (Jun. '43), Eng. Draftsman, Metcalfe Hanson Kansas City Bridge Cos., Edmonton, Alberta, Canada.

Kaltenbach, Charles Joseph (Assoc. M. '43), Engr., U.S. Engrs., Army Post Office 603, Care, Postmaster, Miami, Fla. (Res., 835 Market St., Wheeling, W.Va.)

Kessler, Phillip Arthur (Jun. '43), Maintenance Draftsman, Douglas Aircraft Co., Inc., Park Ridge (Res., 584 South Westmore Ave., Lombard), Ill.

Kline, Wendell Leon (Jun. '43), Junior Engr., Empire Pipeline Co., 4th and Dewey (Res., 711 Osage Ave.), Bartlesville, Okla.

Knowles, Samuel Givens (Jun. '43), Stress Analyst, Douglas Aircraft Co., Santa Monica (Res., 1810 South Barrington, West Los Angeles 25), Calif.

Knue, Joseph Edward, Jr. (Jun. '43), Private, U.S. Army, 501 Short St., Lawrenceburg, Ind.

Knutson, Laurin Alwyn (Jun. '43), Ensign, U.S.N.R., Parshall, N.Dak.

Koontz, Melvin Arthur (Assoc. M. '43), Associate Bridge Engr., State Div. of Highways, Public Works Bldg. (Res., 2208 Ninth Ave.), Sacramento 14, Calif.

Kornspan, Martin Peter (Jun. '43), Engr.-Draftsman (Hydr.), Douglas Aircraft Co., Inc. (Res., 105 Roswell Ave.), Long Beach 3, Calif.

Kusek, Louis Francis (Jun. '43), Junior Engr., Phillips Petroleum Co., 2d and Franklin, Kansas City, Kans. (Res., 3104 Broadway, Kansas City 2, Mo.)

Lee, Joseph Thomas (Jun. '43), 140 South Gayoso St., New Orleans, La.

LeMar, William Bernhardt (Jun. '43), With U.S. Army, Officer Candidate Battalion, (Prov.), Class 29, Bldg. 110, Fort Washington, Md.

Leuschen, Howard Wilson (Jun. '43), Apprentice Engr., Pan Am. Airways, Inc., Terminal, Box 3268, Seattle, Wash.

Lott, Herbert Dale (Assoc. M. '43), Hydr. Engr. Asst., Bonneville Power Administration, 405 Failing Bldg., Portland, Ore.

MacDonald, Thomas Harris (Hon. M. '43), Commr., Public Roads Administration, Federal Works Agency, Washington, D.C.

McCarthy, Leonard Richard (Jun. '43), With U.S. Army, Box 19, Blaney Ave., Cupertino, Calif.

McDonald, Kenneth Osborn (Jun. '43), Ensign, U.S.N.R., 519 Moran, Gainesville, Tex.

McEwen, Robert Stewart (Jun. '43), 2d Lt., Corps of Engrs., U.S. Army, Camp Forrest, Tenn.

McGarry, John (Assoc. M. '43), Area Engr., U.S. Engrs., Millville Army Air Base, Millville, N.J.

McGee, John Joseph (Jun. '43), Lt., U.S. Army, 840 North 6th St., Allentown, Pa.

McKinley, Donald Black (Assoc. M. '43), Constr. Engr., Spencer, White & Prentis, Inc., 10 East 40th St. (Res., 3660 Waldo Ave.), New York 63, N.Y.

McLean, William Robinson (Jun. '43), Junior Structural Engr., TVA, 406 Power Bldg. (Res., 12 Bellflower Circle), Chattanooga, Tenn.

McPhaul, John Joseph (M. '43), Engr., Bureau of Yards and Docks, Navy Dept. (Res., 31 Girard St., N.E.), Washington 2, D.C.

Macon, Boise Ford (Jun. '43), Lt., U.S. Army, O.R.P. (E.C.P.), A.A.A.T.C., Camp Davis, N.C.

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Magrath, Frederick Neale, Jr. (Jun. '43), Ensign, CEC, U.S.N.R., 3098 Dare Pl., New York 61, N.Y.

Messer, Paul Wheaton (Jun. '43), Eng. Layout Man Senior, Goodyear Aircraft Corp., 1210 Massillon Rd. (Res., Y.M.C.A.), Akron, Ohio.

Messinger, Henry McClure (Jun. '43), Party Chf., Huey & Cage, Box 183, Monroe (Res., 401 Jackson, Bastrop), La.

Miller, William Burk (Jun. '43), Ensign, U.S.N.R., Care, D. L. Griffith, Gallia, Ohio.

Miscella, Theodore Paul (Jun. '43), Sgt. (T4), U.S. Army, 32 Chaffee Ave., New York 61, N.Y.

Mountcastle, Robert Boxley (Jun. '43), Private, U.S. Army, 509 Greenwood Rd., Roanoke, Va.

Myers, Philip, III (Jun. '43), Ensign, E-V (S), U.S.N.R., 328 Michigan Union, Ann Arbor, Mich.

Niemi, Toivo Henry (Jun. '43), Junior Engr., Standard Oil Co. of California, 225 Bush St. (Res., 2961 Pacific Ave.), San Francisco, Calif.

Ogle, Claude (Jun. '43), Ensign, CEC, V-(S), U.S.N.R., 600 West 109th St., Los Angeles, Calif.

Ondra, Otakar (Jun. '43), Instr., Civ. Eng., Manhattan College, Spuyten Duyvil Parkway, New York 63, N.Y.

O'Sullivan, Richard Joseph (Jun. '43), With U.S.N.R., Room 4240, Bancroft Hall, U.S. Naval Academy, Annapolis, Md.

Ovalle, Enrique (Jun. '43), Design Engr., Corporacion de Fomento de la Produccion, Ramon Nieto 920 (Res., Agustinas 1408), Santiago, Chile.

Packshaw, Savile (M. '43), With the British Steel Piling Co., Ltd., 10 Haymarket (Res., 98 Rivermead Court), London, S.W. 6, England.

Palazzo, Ralph Dominick (Jun. '43), Junior Designer, Goodyear Aircraft Corp. (Res., 855 Forrest Drive), Akron 6, Ohio.

Pepin, Dick Gordon (Assoc. M. '43), Corporal, U. S. Army, McChord Field, Tacoma, Wash.

Pietrantoni, Manuel Antonio (Jun. '43), Private, U.S. Army, Magdalena Ave., Stop 48, Santurce, Puerto Rico.

Piatelli, Leon Paul (Jun. '43), Ensign, CEC, U.S.N.R., 56 Rockdale St., Mattapan, Mass.

Poppell, Edgar Allan (Assoc. M. '43), Engr. (Structural), (P-4), U.S. Engr. Office (Res., 1618 Walnut St.), Jacksonville 6, Fla.

Quirk, Willard Raymond (Jun. '43), Liaison Engr., Douglas Aircraft Co. (Res., 1133 North Main), Tulsa 6, Okla.

Randall, Robert Henry (Jun. '43), Technical Writer, Douglas Aircraft Co., Inc., 5651 West Manchester, Los Angeles (Res., 933 Ocean Ave., Santa Monica), Calif.

Raulin, Albert Francis (Jun. '43), Asst. Testing Engr., Dravo Corp., Neville Island, Pittsburgh (Res., 221 Melville Lane, Sewickley), Pa.

Roberds, Billy (Jun. '43), 2d Lt., Corps of Engrs., U.S. Army, U.S. Engr. Office, Hanford Engr. Works, Box 550, Pasco, Wash.

Rock, Philip Arthur (Jun. '43), Instr., Civ. Eng., Rhode Island State College, Kingston, R.I.

Roggeveen, Vincent Jacob (Jun. '43), Junior Engr., Civil Aeronautics Administration, 84 Marietta St., N.W., Atlanta 3, Ga. (Res., 401 East 50th St., New York 22, N.Y.)

Rouverol, William Spence (Jun. '43), Junior Engr., Standard Oil Co., of California, 225 Bush St. (Res., 1729 Vallejo St.), San Francisco, Calif.

Sahinen, George Fredolf (Assoc. M. '43), Chf. Designing Engr., State Water Conservation Board, Armory Bldg., Helena, Mont.

Saum, Jack Urban (Assoc. M. '43), Civilian Employee, U.S.N., Navy 1955, Cristobal, Canal Zone.

Schaper, David Henry (Jun. '43), Ensign, CEC-V (S), U.S.N.R., 538 Mohawk Drive, Erie, Pa.

Schuster, Irving (Jun. '43), Junior Engr., Curtiss-Wright Corp. (Res., 101 East 13th Ave.), Columbus, Ohio.

Skans, William Samuel, Jr. (Jun. '43), Detail Engr., Boeing Aircraft Co., 2d and Union (Res., 6012 Palatine), Seattle, Wash.

Small, Gilbert (M. '43), Bridge and Sewer Engr., Public Works Dept., City Hall (Res., 62 Lenox Ave.), Providence, R.I.

Smart, Philip Edward (Jun. '43), 49 Orchard St., Portsmouth, N.H.

Smith, Wade Wagner (Jun. '43), Operator, Grain and Dairy Farm, Walnoaks Dairy, W. L. Smith & Son, R.F.D. 7, Knoxville, Tenn.

Solanas, Homer Delph (Jun. '43), Eng. Draftsman, Consolidated Vultee Aircraft Corp., New Orleans Div. (Res., 5859 Catina St.), New Orleans, La.

Stanley, Eugene Anderson (M. '43), Gen. Supt., Espy Paving & Constr. Co., 108 East Bay St., Savannah, Ga.

Studebaker, Donald Jay (Jun. '43), Contact Engr., North Am. Aviation, Kansas City, Kans. (Res., 4975 Ward Parkway, Kansas City, Mo.)

Sura, Walter Michael (Jun. '43), Junior Engr., Eastern Aircraft, Gen. Motors, Bloomfield (Res., 61 Highland Ave., Passaic), N.J.

Sutherland, William Taylor (Assoc. M. '43), Capt., Corps of Engrs., U.S. Army, 3209 West End Ave., Nashville, Tenn.

Swaisgood, Frank Raymond (Jun. '43), Stress Analyst, Boeing Aircraft Co. (Res., 4811 Myrtle Ave.), Seattle, Wash.

Swenson, William Warren (Jun. '43), 210 Tuscarora Rd., Buffalo, N.Y.

Thomas, Harold Coldwell (Jun. '43), With U.S. Army, 60 Columbus Ave., North Easton, Mass.

Thompson, Robert Allen (Jun. '43), Draftsman, Bethlehem Steel Co., 20th and Illinois Sts. (Res., 132 Tara St.), San Francisco, Calif.

Thuesen, Roger Johnson (Jun. '43), Asst. Engr., Douglas Aircraft Co., Inc., El Segundo (Res., 600 South Fir. Apt. 2, Inglewood), Calif.

Udell, Harold (Assoc. M. '43), Asst. Public Health Engr., U.S. Public Health Service, State Dept. of Public Health, State House, Boston (Res., 24 Lafayette St., Dracut), Mass.

Van Der Boon, Georoges Firmin Jean (M. '43), 1st Lt., Corps of Engrs., U.S. Army, 247 East 52d St., New York 22, N.Y.

Volakakis, John George (Jun. '43), Graduate Asst., Illinois Inst. of Technology, 3300 South Federal St. (Res., 4301 West Congress St.), Chicago, Ill.

Waggoner, Grant Wyckliffe, Jr. (Jun. '43), Aeronautical Engr., Curtiss-Wright Corp., Crittenden Drive (Res., 1371 South 4th), Louisville, Ky.

Wagner, Daniel Joseph (Jun. '43), Private First Class, U.S.M.C., 624 Twelfth St., Union City, N.J.

White, Leonard Newton (M. '43), Maj., Corps of Engrs., U.S. Army, 909 Rector Bldg., Little Rock, Ark.

Wiard, Leon Allen (Assoc. M. '43), Asst. Hydr. Engr., Water Resources Branch, U.S. Geological Survey, 302 East State St. (Res., 507 Turner Pl.), Ithaca, N.Y.

Wilson, Harry Ray (Jun. '43), Corporal, U.S. Army, 1517 Grant Ave., Ogden, Utah.

Wilson, Marion Evans (Jun. '43), Armament Engr., North Am. Aviation (Res., 610 North 9th), Kansas City, Kans.

Wong, Anthony Buck-Lock (Jun. '43), Junior Transitman and Draftsman, Bethlehem Steel Co. (Res., 36 Iliahi St.), Honolulu 52, Hawaii.

Wong, Sin-Yuan (Assoc. M. '43), Engr., National Resources Comm. of Chinese Govt., 40 Wall St., Room 1335, New York 5, N.Y.

Wright, Frank Henry (Jun. '43), Ensign, CEC, U.S.N.R., 84 South Orchard St., Logan, Ohio.

Zimnoch, Vincent Paul (Jun. '43), Structural Engr., Curtiss-Wright, Crittenden Drive (Res. 3918 Hy-Cliff Ave., St. Mathews), Louisville, Ky.

Yamashita, Thomas Isao (Jun. '43), Office Engr., Intrusion-Prepakt, Inc., 309 West Jackson Blvd., Chicago 6, Ill.

Membership Transfers

Adams, John Middleton (Assoc. M. '23; M, '43), Constr. Engr., Defense Public Works Region 7, Federal Works Agency, 511 Alaska Bldg. (Res., 1226 Third Ave., West), Seattle 99, Wash.

TOTAL MEMBERSHIP AS OF NOVEMBER 9, 1943

Members	6,000
Associate Members	7,299
Corporate Members	13,299
Honorary Members	36
Juniors	5,817
Affiliates	74
Fellows	1
Total	19,227
(November 9, 1942	18,100)

Burleigh, Albert Frederick (Jun. '32; Assoc. M. '43), Asst. Hydr. Engr., U.S. Engr. Office, Rock Island, Ill.

Coffey, Philip John (Jun. '36; Assoc. M. '43), Capt., San. Corps, U.S. Army, Care, Am. Embassy, Managua, Nicaragua.

Compton, Charles Ross (Assoc. M. '26; M. '43), Asst. Chf. Engr., Los Angeles County Sanitation Dists., 110 South Broadway, 4th Floor, Los Angeles 12, Calif.

Connor, Edward Hanson (Jun. '90; Assoc. M. '92; M. '00; Hon. M. '43), Vice-Pres. and Cons. Engr., Mo. Val. Bridge & Iron Co. (Res., 233 Third Ave.), Leavenworth, Kans.

Cooman, Carl Conrad (Assoc. M. '20; M. '43), Civ. Engr., Rochester Gas and Elec. Corp., 89 East Ave. (Res., 28 Woodrow Ave., Beechwood Station), Rochester 9, N.Y.

Crowe, Francis Trenholm (Assoc. M. '10; M. '15; Hon. M. '43), Gen. Supt., Shasta Dam, Pacific Constructors, Inc., Box 760, Shasta Dam, Calif.

Dickeman, Charles Theodore (Assoc. M. '24; M. '43), Capt. CEC, U.S.N., Davisville, R.I.

Driskell, John Joseph (Jun. '37; Assoc. M. '43), Associate Engr. (Structural), U.S. Engrs., 751 South Figueroa St., Los Angeles (Res., 561 North Milton Drive, San Gabriel), Calif.

Greulich, Gerald Gregory (Assoc. M. '39; M. '43), Cons. Engr., Specialty Div., Sales Dept., Carnegie Illinois Steel Corp., 434 Fifth Ave. (Res., 778 Osage Rd.), Pittsburgh 16, Pa.

Lawrence, Ray Ellsworth (Assoc. M. '30; M. '43), Lt. Col. Corps of Engrs., U.S. Army, 1727 Massachusetts Ave., N.W., Washington, D.C.

Learned, Alvah Chester (Jun. '36; Assoc. M. '43), Supt., Pipe Dept., Dow Magnesium Corp., Velasco, Tex.

McInnis, John Lawson, Jr. (Jun. '38; Assoc. M. '43), Asst. Contract Engr., E. I. du Pont de Nemours & Co., Inc., Hanford Engr. Works, Hanford (Res., Richland), Wash.

Mangasarian, Richard Dicran (Jun. '38; Assoc. M. '43), 2653 Decatur Ave., New York 58, N.Y.

Matteson, Eldon Franklin (Jun. '36; Assoc. M. '43), Ensign, CEC, V (S), U.S.N.R., Box 397, Hillsboro, N.C.

Matthes, Gerard Hendrik (Assoc. M. '00; M. '05; Hon. M. '43), Director, U.S. Waterways Experiment Station, Box 631, Vicksburg, Miss.

Robertson, Cecil Winston (Jun. '41; Assoc. M. '43), Project Engr. (Constr.), E. B. Badger & Sons Co., Box 1201 (Res., 211 Virginia), Baytown, Tex.

Seeley, John Cooley (Jun. '37; Assoc. M. '43), Project Mgr., Contract Noy 7577, Shoecraft, Drury & McNamee, Care, Doyle & Russell (Res., 522 North Shore Rd.), Norfolk 5, Va.

Sharkey, Fred John (Assoc. M. '31; M. '43), Office Engr., U.S. Bureau of Reclamation, Coulee Dam, Wash.

Silverman, Max (Assoc. M. '28; M. '43), Civ. Engr., Dept. of Parks, City of New York, Arsenal, 64th St. and Fifth Ave., New York 21, N.Y.

Stocking, Ernest Joseph (Assoc. M. '29; M. '43), Asst. Chf., Examining and Personnel Utilization Div., U.S. Civ. Service Comm., 8th and F Sts., N.W., Washington, D.C.

Van Driest, Edward Reginald (Jun. '36; Assoc. M. '43), Associate Prof., Dept. of Civ. Eng., Univ. of Connecticut, Storrs, Conn.

von Schlatzer, Robert Karl (Jun. '41; Assoc. M. '43), Associate Highway Engr., U.S. Public Roads Administration, Federal Works Agency, Apartado Q, San Jose, Costa Rica. (Res., 1511 Odell Ave., Baltimore 6, Md.)

Witzig, Berard John (Jun. '35; Assoc. M. '43), Engr. (Civ.), U.S. Engr. Office, 960 Ellicott Sq. Bldg., Buffalo (Res., 187 Lincoln Ave., Orchard Park), N.Y.

Wright, Charles Penzel (Assoc. M. '31; M. '43), Constr. Engr., TVA, Farner, Tenn. (Res., Hiwassee Dam, N.C.)

Reinstatements

Bonini, Francis John, Assoc. M., reinstated Oct. 20, 1943.

Hands, Stanley Moore, Assoc. M., reinstated Nov. 5, 1943.

Jones, Charles Dornbusch, Assoc. M., reinstated Oct. 14, 1943.

Mann, David Morton, Jun., reinstated Oct. 26, 1943.

Michael, William Whipple, M., reinstated Oct. 26, 1943.

Resignations

Scrivens, Walter Ambrose, Jr., Jun., resigned Oct. 8, 1943.

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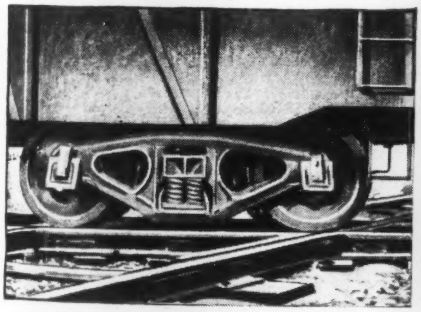

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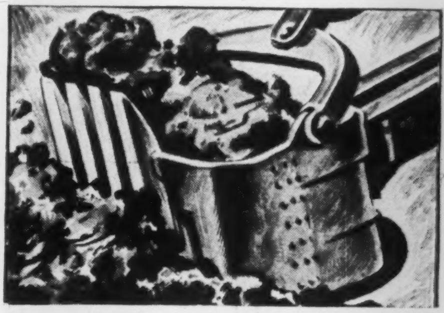

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Applications for Admission or Transfer

Condensed Records to Facilitate Comment from Members to Board of Direction

December 1, 1943 — Number 12

The Constitution provides that the Board of Direction shall elect or reject all applicants for admission or for transfer. In order to determine justly the eligibility of each candidate, the Board must depend largely upon the membership for information.

Every member is urged, therefore, to scan carefully the list of candidates published each month in Civil Engineering *and to furnish the Board with data which may aid in determining the eligibility of any applicant.*

It is especially urged that a definite recommendation as to the proper grading be given in each case, inasmuch as the grading must be based upon the opinions of those who know the applicant personally as well as upon the nature and extent of his professional experience. Any facts aerogatory to the personal character or professional reputation of an applicant should be promptly communicated to the Board.

Communications relating to applicants are considered strictly confidential.

The Board of Direction will not consider the applications herein contained from residents of North America until the expiration of 30 days, and from non-residents of North America until the expiration of 90 days from the date of this list.

MINIMUM REQUIREMENTS FOR ADMISSION

Grade	General Requirement	Age	Length of Active Practice	Responsible Charge of Work
Member	Qualified to design as well as to direct important work	35 years	12 years	5 years RCM*
Associate Member	Qualified to direct work	27 years	8 years	1 year RCA*
Junior	Qualified for subprofessional work	20 years	4 years	
Affiliate	Qualified by scientific acquirements or practical experience to cooperate with engineers	35 years	12 years	5 years RCM*

* In the following list RCA (responsible charge—Associate Member standard) denotes years of responsible charge of work as principal or subordinate, and RCM (responsible charge—Member standard) denotes years of responsible charge of IMPORTANT work, i.e., work of considerable magnitude or considerable complexity.

APPLYING FOR MEMBER

Anderson, John Henning (Assoc. M.), Lakewood, Ohio. (Age 54) (Claims RCA 9.7 RCM 16.3) Aug. 1940 to date with Carnegie-Illinois Steel Corporation, as Constr. Engr., and (after May 1942) Chf. Engr., Ordnance Eng. Bureau; previously member of firm, Anderson & Co., Chicago, Ill.

Beard, Frank Joseph, Kahoka, Mo. (Age 50) (Claims RCA 3.7 RCM 17.2) May 1942 to July 1943 Engr. for Archer & Archer, Archt.-Engrs., Kansas City, Mo., and July 1943 to date on private work for Kahoka, Mo.; previously private consulting engineering.

Brenton, Walter, New York City. (Age 50) (Claims RCM 13.5) Feb. 1943 to date with USNR at Camp Peary, Va., and (since May 1943) Asst. Public Works Officer and Officer in Charge of Civilian Personnel, Naval Air Station, New York City; May 1924 to Feb. 1943 with Portland (Ore.) Gen. Elec. Co., after July 1929 as Chf. Engr.

Buell, Arthur Marquis, Olympia, Wash. (Age 44) (Claims RCA 6.8 RCM 10.8) Feb. 1928 to date with Bridge Div., Washington Highway Dept., first as Bridge Designer, and (since Dec. 1937) Designing Engr.

Chancellor, Herbert Hall, Houston, Tex. (Age 47) (Claims RCA 5.0 RCM 13.0) Feb. 1941 to date with Reconstruction Finance Corporation, at present as Div. Engr.; previously private practice; with PWA.

Donohue, Joseph John, Denver, Colo. (Age 49) (Claims RCA 6.4 RCM 15.4) June 1941 to date Chf. Engr. of Highways and Railroads, Whitman, Requardt & Smith, Archt. Engrs. for construction of arsenals; previously Plans Engr., Pennsylvania Turnpike Comm.; in private engineering work.

Easley, Modie Wilson, Cincinnati, Ohio, (Age 46) (Claims RCA 14.6 RCM 5.2) Dec. 1935 to date Asst. Engr., Southern Ry.

Ellington, Vernon Stetter, Muskogee, Okla. (Age 42) (Claims RCA 2.3 RCM 14.6) Jan., 1943 to date Constr. Engr., Foley Bros., Inc.; previously with Stone & Webster; Underpinning Engr., S. R. Rosoff (Park Contr. Corporation).

Fitzpatrick, Edward Bernard, New York City. (Age 48) (Claims RCA 3.5 RCM 13.8) Feb. 1943 to date Cons. Engr., Sanborn, Fitzpatrick and Murphy; previously Designing Engr., Mackenzie, Sanborn & Bogert; Chf. of Planning, FWA.

Gerhardt, Manfred James, San Antonio, Tex. (Age 44) (Claims RCA 11.2 RCM 7.8) March 1941 to date with U.S. Engrs., as Engr., and (since April 1942) Senior Engr.; previously Asst. Mgr., Structural Dept., Robert & Co., Inc., Archt. and Engrs.; with W. E. Simpson Co., Cons. Engrs., San Antonio.

Hart, Roy Putman, Webster Groves, Mo. (Age 51) (Claims RCA 9.4 RCM 14.4) June 1913 to date with Missouri Pacific Railroad in various capacities, since July 1938 as Acting Bridge Engr. and Bridge Engr.

Hasson, Frank Waxter, Balboa Heights, C.Z. (Age 49) (Claims RCA 2.8 RCM 19.1) May 1937 to date Structural Engr., Office Eng. Div., The Panama Canal.

Hillis, William Lowry, Pittsburgh, Pa. (Age 39) (Claims RCA 2.1 RCM 11.9) Aug. 1934 to Dec. 1935, and June 1936 to date with U.S. Engr. Office in various capacities, since June 1942 as Engr.

Hilton, Elton Monroe, Camp Roberts, Calif. (Age 48) (Claims RCA 9.6 RCM 9.9) June 1942 to Sept. 1943 Capt. and Sept. 1943 to date Major, Corps of Engrs., U.S. Army; previously with National Park Service, finally as Park Engr.

Hydle, Magnus Lawrence, San Diego, Calif. (Age 58) (Claims RCA 16.6 RCM 5.7) Jan. 1942 to date with Consolidated Aircraft Corporation, Plant Eng. Dept., San Diego, as Structural Engr., and (at present) Constr. Engr.; previously Jun. Highway Engr., California Div. of Highways.

McCoy, George Thomas, Sacramento, Calif. (Age 54) (Claims RCA 7.9 RCM 20.2) June 1927 to date with California Div. of Highways, as Asst. Office Engr., Asst. Highway Engr., and (since Jan. 1943) State Highway Engr.

Muspratt, Paul Moisseeff, Shavertown, Pa. (Age 47) (Claims RCA 1.2 RCM 16.3) 1929 to date Contr., Designer and Manufacturer of reinforced concrete flexible mine-roof supports.

Nelson, Mark Lee, Portland, Ore. (Age 35) (Claims RCA 3.7 RCM 6.2) June 1929 to date with Dist. Engr., U.S. Engr. Office, in various capacities, since Oct. 1942 as Senior Engr. (Civ.).

Oldt, Floyd Stix, Dallas, Tex. (Age 47) (Claims RCA 8.2 RCM 12.8) April 1941 to date in private practice, Dallas, Tex.; previously Supt. of Constr. with McKenzie Constr. Co., San Antonio, and with Robert E. McKee, El Paso; Partner with E. J. Bush, Dallas, Tex.; Examining Engr., PWA.

Rankin, Renville Stevens, New York City. (Age 52) (Claims RCA 12.0 RCM 11.0) Jan. 1927–Jan. 1928 and Jan. 1929 to date Sales Engr., The Dorr Co., New York City, since 1937 managing San. Eng. Div.

Sherrill, Miles Osborne, Louisville, Ky. (Age 38) (Claims RCM 16.2) Feb. 1943 to date with Southern Mapping & Eng. Co., Greensboro, N.C.; previously with U.S. Engr. Dept.; with C. K. S. Dodd, Cons. Engr., Sarasota, Fla.; selling and installing engineering equipment, etc.

Winslow, Ralph Edward, Troy, N.Y. (Age 42) (Claims RCA 3.8 RCM 13.4) Sept. 1930 to date with Rensselaer Polytechnic Inst., Troy, N.Y., as Associate Prof. of Architecture, Prof. of Architectural Design, and (since April 1941) Prof., and Head of Dept. of Architecture.

Wood, Howard Charles (Assoc. M.), Oakland, Calif. (Age 43) (Claims RCA 6.2 RCM 8.7) Oct. 1931 to Sept. 1939 and Dec. 1940 to date with San Francisco–Oakland Bay Bridge as Associate Bridge Designing Engr., then Senior Bridge Engr. in the interim with California Bridge Dept., Sacramento.

APPLYING FOR ASSOCIATE MEMBER

Adams, Harry Wesley, Columbus, Ohio. (Age 35) (Claims RCA 7.1 RCM 3.0) June 1930 to date with U.S. Engr. Office in various capacities, at present as Engr. (Hydr.), Ohio River Div., Cincinnati and Columbus, Ohio.

Adams, Ludwig (Junior), Pittsburgh, Pa. (Age 27) (Claims RCA 5.5) May 1942 to date Research Engr., Chemical Storage Fellowship, Mellon Inst. of Industrial Research; previously Asst. to Project Mgr., National Advisory Comm. on Aeronautics; with Pittsburgh-Des Moines Steel Co. in various capacities.

Almond, James Clayton, Opportunity, Wash. (Age 36) (Claims RCA 4.1 RCM 3.7) Dec. 1941 to date Chf. Field Engr., United Engr. & Foundry Co., Pittsburgh, Pa.; previously with U.S. Engrs., Bonneville, Ore.; Engr. for private parties and City of Green River, Wyo.

Barrows, Raymond John, New York City. (Age 47) (Claims RCA 15.8) March 1942 to date Water Plant Foreman and Gen. Supt. of water plants, etc., for U.S. Naval Operating Base; previously Hydr. Engr., Frederick Snare Corporation, U.S. Naval Operating Base, Topographical Draftsman and Surveyor, Fidelity Sugar Co., San German, Oriente Cuba.

Britt, Alvin Columbus, Aliceville, Ala. (Age 34) (Claims RCA 3.1 RCM 3.2) Sept. 1941 to date with U.S. Engrs. as Asst. Engr. and Associate Engr., since April 1943 at Prisoner of War Camp, Aliceville, Ala.; previously Project Engr., WPA.

Byrne, Wayne Shannon, Altus, Okla. (Age 32) (Claims RC 5.6 D 0.3) Oct. 1933 to date with Bureau of Reclamation in various capacities, since July 1940 as Associate Engr. and (after April 1942) also Engr.

Canter, Prentice Irwin, Lake Charles, La. (Age 38) (Claims RCA 3.2 RCM 1.2) Sept. 1942 to date Chf. Field Engr., M. W. Kellogg Co.; previously Eng. Designer with Hart, Freeland & Roberts; with Tennessee Highway Dept. (intermittently) in various capacities.

Carlock, Howard Joseph (Junior), Jackson Heights, N.Y. (Age 27) (Claims RCA 2.1 RCM 0.3) Jan. 1943 to date Senior Designing Engr., Newsom & Aldrich, New York City; previously with Madigan-Hyland as Designer, Chf. Hydr. Designer and Engr. in Chg., Hydr. Div.; with Metcalf & Eddy, New York City, as Asst. Engr.

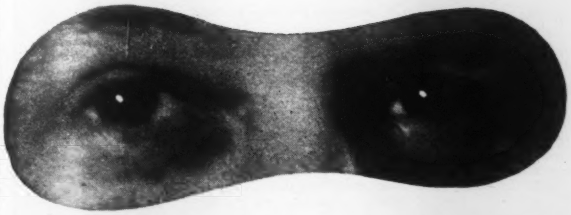
Cole, Dallas Ervie, Los Angeles, Calif. (Age 40) (Claims RCA 9.4 RCM 1.0) Nov. 1941 to July 1942 Asst. Engr., and July 1942 to date Associate Engr., Flood Control Reports Sec., Los Angeles Dist. Office, U.S. Engr. Dept.; previously Hydrographer, Dept. of Water & Power, City of Los Angeles.

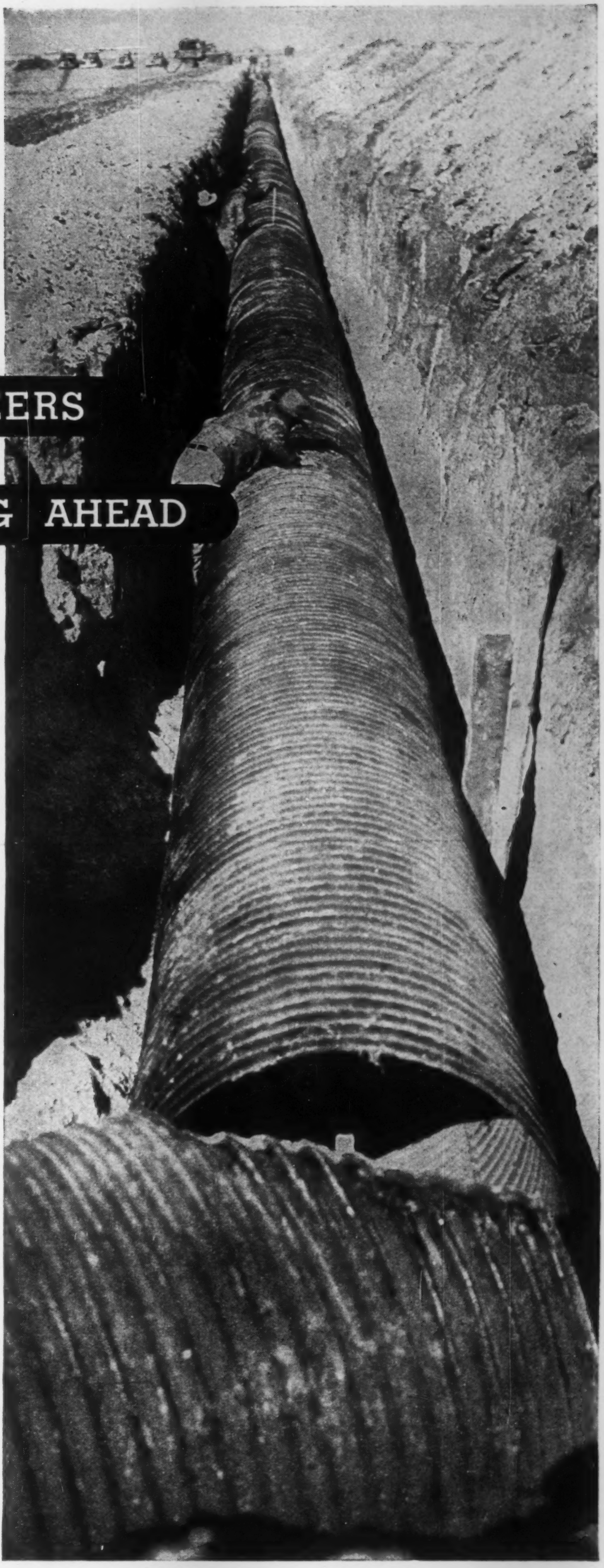
Darling, James William (Junior), Jacksonville, Fla. (Age 31) (Claims RCA 4.5) Oct. 1934 to date with U.S. Engrs. in various capacities, since June 1943 as Office Engr., Operations Div., Jacksonville (Fla.) Dist.

Dodge, Alexander, Portland, Ore. (Age 44) (Claims RCA 6.5 RCM 3.2) March 1935 to Aug. 1937, and Aug. 1939 to date with U.S. Engrs. in various capacities, at present as Engr.; in the interim Bridge Designer, Washington Highway Dept.

Dunsmore, Herbert J., Marshall, Mich. (Age 33) (Claims RCA 1.1 RCM 7.7) April 1935 to date with Michigan Highway Dept. in various capacities, since May 1938 being Public Health Engr., Calhoun County (Mich.) Health Dept.

Dysland, Lloyd Sanders (Junior), Portsmouth, Va. (Age 30) (Claims RCA 3.9 RCM 0.3) March 1942 to date Associate Structural Engr., Norfolk Navy Yard, Portsmouth, Va.; previously Senior Layout Draftsman (Structural), Lockheed Aircraft Corpora-





FOR SEWER ENGINEERS

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The flexible corrugated metal design of ARMCO Pipe prevents breakage; and band couplers make for strong, tight joints. Longer lengths and fewer joints mean lower installation costs. Cradling is unnecessary. Corrosion is shackled by a full bituminous coating tightly bonded to the base metal. A thick bituminous pavement checks erosion—makes the bottom last as long as the top.

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ASBESTOS-BONDED

ARMCO SEWER PIPE

tion, Burbank, Calif.; Jun. Civ. Engr., Cook County Highway Dept., Chicago, Ill.; Draftsman and later Designer, with Consoer, Townsend & Quinlan, Chicago, Ill.

Ellenson, Sol, Newport News, Va. (Age 34) (Claims RCA 2.7) Sept. 1927 to date with City of Newport News in various capacities, since March 1941 as Asst. Director of Public Works, and Head, Public Works Dept.

Fry, Regis Florian (Junior), Pittsburgh, Pa. (Age 32) (Claims RCA 2.7 RCM 0.7) March 1937 to date with Pittsburgh-Des Moines Steel Co. in various capacities, at present as Design Engr.

Golden, Joseph Francis, El Centro, Calif. (Age 33) (Claims RCA 7.4 RCM 0.7) March 1943 to date Civ. Engr., Public Works Dept., Marine Corps Air Station; previously Supervisor of Surveys, Kistner, Curtis & Wright, Archts. & Engrs.; with Imperial (Calif.) Irrigation Dist.

Gregory, John Samuel, Pasadena, Calif. (Age 34) (Claims RCA 6.2) Oct. 1940 to April 1941 Eng. Draftsman and Sept. 1943 to date Senior Designer, Leeds, Hill, Barnard & Jewett; in the interim Utility Engr. with Ralph E. Phillips, then Civ. Engr., Errick, Phillips, Fitzgerald & Flewelling.

Guins, George Alexander, Corvalis, Ore. (Age 34) (Claims RCA 2.1 RCM 1.2) Sept. 1942 to date student in Civ. Eng., Oregon State Coll.; Feb. 1941 to Sept. 1942 Engr., Oregon Shipbuilding Corporation; Engr., Portland Gravel Co.; Draftsman with Iron Fireman Mfg. Co., and American Can Co., Portland.

Harris, Jack, Sulphur, La. (Age 52) (Claims RCA 21.9 RCM 6.4) Sept. 1942 to date Asst. Supt., M. W. Kellogg Co.; previously in private practice.

Hofmann, Oliver Dimmitt (Junior), Balboa Island, Calif. (Age 31) (Claims RCA 3.1) Jan. 1942 to date with J. A. Woolley, Cons. Engr., Santa Ana, Calif., as Res. Engr., Field Engr., Constr. Supt., and Office Engr.; previously Chf. of Survey Party for Norman O. Glover, Land Surveyor, San Diego, Calif.; with Dimmitt & Taylor, Eng. Contrs., Los Angeles.

Kelly, George Washington, Baltimore, Md. (Age 52) (Claims RCA 22.9 RCM 1.7) 1912 to 1917 and April 1921 to date with City of Baltimore in various capacities, since March 1942 as Chf. Designing Engr.

Knedel, Charles Joseph, San Francisco, Calif. (Age 34) (Claims RCA 1.5) July 1930 to June 1933 Jun. Eng. Field Aide, and Senior Eng. Field Aide, and April 1939 to date Jun. Bridge Engr., Bridge Dept., California Div. of Highways; in the interim Senior Eng. Field Aide and Jun. Bridge Constr. Engr., San Francisco–Oakland Bay Bridge.

Kramrisch, Fritz, Detroit, Mich. (Age 33) (Claims RCA 4.2) Sept. 1940 to date with Albert Kahn, Associated Archts. & Engrs.; previously with C. S. Allott & Son, Manchester, England.

Lincoln, Robert Bicknell, Morgan City, La. (Age 29) (Claims RCA 2.7 RCM 4.1) March 1943 to date Asst. and Tech. Adviser to Officer-in-Chg. of Constr. at U.S. Naval Dry Docks, Morgan City, La., for U.S. Bureau of Yards & Docks; previously Structural Designer, Frederic R. Harris, Inc., New York City; with Lockwood Greene Engrs., Inc., in various capacities.

Little, James Gilbert, Knoxville, Tenn. (Age 43) (Claims RCA 2.4) June 1941 to date Asst. Structural Engr., TVA; previously with Michigan Highway Dept., Bridge Design Div., in various capacities.

Lockwood, Roy Valentine, Foxhall, Norfolk, Va. (Age 28) (Claims RCA 2.8) Feb. 1942 to date with Public Works Div., Norfolk Navy Yard, Portsmouth, Va., as Jun. Structural Engr., Asst. Structural Engr., and (at present) Associate Structural Engr.; previously with Mun. Eng. Div., The Panama Canal.

Lorne, James Joseph, Rockaway Beach, N.Y. (Age 35) (Claims RCA 1.9 RCM 0.3) May 1942 to date Structural Designer, Frederic R. Harris, Inc., Cons. Engrs., New York City; previously Eng. Asst., Office of Pres., Borough of Manhattan.

McDuell, John William, San Francisco, Calif. (Age 32) (Claims RCA 3.4 RCM 1.3) Dec. 1942 to date Lt. (jg), USNR; previously Field Engr., Pacific Clay Products of Los Angeles; Utilities Engr., Walt Disney Studios.

Makainai, Jesse Kealiihoohie, Honolulu, Hawaii. (Age 43) (Claims RCA 12.4) Oct. to Nov. 1939 and July 1940 to date with Contractors Pacific Naval Air Bases as Eng. Draftsman, and (since Sept. 1941) Topographical Engr., Public Works Design Sec., 14th Naval Dist., Pearl Harbor; in the interim Surveyor, CAA.

Marsh, Dorsey Ewing, San Francisco, Calif. (Age 39) (Claims RCA 10.9) Sept. 1933 to date Asst. Bridge Engr., and (since May 1937) also Asst. to Maintenance Engr., San Francisco–Oakland Bay Bridge.

Maynard, Norman Jack, Covington, Ky. (Age 41) (Claims RCA 6.5 RCM 9.3) Jan. 1940 to date City Mgr., Covington, Ky.; previously with U.S. Govt. as Chf. of Party, Transit Engr., and Field Engr.

Melnikov, Dimitri Nicholas, Pasadena, Calif. (Age 41) (Claims RCA 2.3) Dec. 1931–July 1942 and Sept. 1943 to date with Los Angeles County Flood Control Dist. in various capacities, after July 1941 being Design Engr.; in the interim Constr. Engr., Hardway Contr. Co.

Miller, Victor Alfred, Glendale, Calif. (Age 45) (Claims RCA 11.0) Aug. 1935 to date with Los Angeles County Flood Control Dist., as Eng. Aide, and (since June 1941) Civ. Engr.

Pack, John George, Jr., Miami, Fla. (Age 33) (Claims RCA 5.1 RCM 2.0) Sept. 1936 to date with U.S. Engr. Office in various capacities, since Feb. 1943 as Engr. (ungraded), Miami, Fla.

Peterson, Harold V., Los Angeles, Calif. (Age 49) (Claims RCA 10.9) Jan. to June 1939 Recorder and Oct. 1941 to date Geologist, U.S. Geological Survey; in the interim Associate Engr. Geologist, U.S. Corps of Engrs.

Plummer, Richard Merrill, Painesville, Ohio. (Age 45) (Claims RC 19.4) Jan. 1927 to date Asst. Engr., County Engr.'s Office.

Price, John Ford, Ft. Smith, Ark. (Age 38) (Claims RCA 2.1) Feb. 1943 to date Associate Engr., U.S. Engr. Dept., Office of Area Engr., Camp Chaffee, Ark.; previously with Black & Veatch as Chf. of Party and Asst. Engr.; Instrumentman, Arkansas Highway Comm., Little Rock.

Royce, Thomas Cochran (Junior), Camp Peary, Va. (Age 44) (Claims RCA 2.0) Sept. 1943 to date Chf. Carpenter's Mate, U.S. Naval Constr. Battalion; May 1942 to Sept. 1943 Asst. Engr. (Civ.), U.S. Engrs., Sacramento Dist., Fresno area; previously with California Div. of Highways.

Salgo, Michael Nicholas (Junior), Charleston, S.C. (Age 29) (Claims RCA 0.9 RCM 1.8) May 1940 to date with U.S. Navy Yard, Charleston, S.C., in various capacities, since Feb. 1942 as Associate Structural Engr.; previously with City of Chicago.

Suwall, Bernard Ferdinand, Baltimore, Md. (Age 38) (Claims RCA 1.6) Feb. 1925–Aug. 1929 and Jan. 1930 to date with Bureau of Sewers, Baltimore, Md., in various capacities, since March 1942 as 1st Asst. to Chf. Designing Engr., and since July 1943 also Associate Civ. Engr.; in the interim Asst. Topographic Draftsman, U.S. Army Engrs.

Thornquist, Edwin Alton (Junior), Waterloo, Iowa. (Age 32) (Claims RCA 3.2 RCM 4.2) May 1943 to date Associate Engr., M. L. Todd & Associates, Archt.-Engrs., Waterloo, Iowa; previously Dept. Head (Specifications) and Eng. Designer, Gannett, Eastman & Fleming, Inc., Archt. Engrs., Camp Springs-Meadows (Md.) Air Base; Eng. Designer, Burns & McDonnell, Rosecrans Field, St. Josepth, Mo. and Buell, Winter & Beuttler, Archt.-Engrs., Sioux City (Iowa) Air Base; in private practice; Chf. Draftsman and Structural Engr.

Tindal, Levy Rhame, III (Junior), Hampton, Va. (Age 33) (Claims RCA 3.6) Feb. 1941 to date with National Advisory Comm. for Aeronautics, Langley Field, Va., as Senior Structural Draftsman, and (since June 1942) Asst. Civ. Engr.; previously with Virginia Dept. of Highways, Richmond.

APPLYING FOR JUNIOR

Gonzalez-Arriagada, Oscar, Ann Arbor, Mich. (Age 29) Feb. 1943 to date graduate student, Univ. of Michigan.

Hoerber, Norman Clemens, St. Louis, Mo. (Age 25) (Claims RCA 1.4) Oct. 1942 to date Civ. Engr., C. E. Smith & Co., Cons. Engrs.; previously Structural Draftsman, Allegany Ordnance Plant; Draftsman, St. Louis Ordnance Plant.

Kantz, Ralph Clayton, Jr., Tacoma, Wash. (Age 27) (Claims RCA 2.5 RCM 0.5) April 1943 to date Archt. Engr., Tacoma, Light Dept.; previously Archt. Engr., The Victory Archts. & Engrs. Associated, and Reinforced Concrete Detailer, The Austin Co., both in Oklahoma City, Okla.

Narciso, Angelo James, Hapeville, Ga. (Age 31) (Claims RCA 1.3) March 1941 to date Jun. Civ. Engr., Asst. Airways Engr., Associate Engr., Airways Eng. Branch, CAA; previously Paving Inspector, U.S. Bureau of Public Roads, Washington National Airport and Bolling Field, Washington, D.C.; Instrumentman, McClosky & Co., Philadelphia, Pa.

Torres De Castro, Guillermo, Santiago, Chile. (Age 26) May 1941 to Dec. 1942 Asst. Engr., Dept. of Hydraulics of Gen. Direction of Public Works of Chile.

Willis, Homer Benton, Louisville, Ky. (Age 25) (Claims RCA 1.4) Sept. 1940 to date with War Dept., U.S. Engr. Office, Louisville, Ky., successively as Student Engr., Jun. Engr., and (since July 1942) Asst. Engr.; previously with Ohio Dept. of Highways.

VIRTUAL GRADUATE

N.C. STATE COLL.

(C.E.)

	Age
Kelly, James Fredrick	(20)

(Requirements completed. Degree to be conferred in 1944.)

UNIV. OF TEX.

(B.S. in C.E.)

Jones, Emzy Theodore, Jr.	(23)

1943 GRADUATES

UNIV. OF CIN.

(C.E.)

Anderegg, James Albert	(22)
Connelly, John Patrick	(22)

DREXEL INST. TECH.

(B.S. in C.E.)

Miller, Paul Drennen, Jr.	(22)

GA. SCHOOL TECH.

(B.S. in C.E.)

Burford, William Owen	(24)
Edelblut, Walter Joseph, Jr.	(23)
Piperas, Nicholas, Jr.	(22)
Wellborn, Carlton Juan, Jr.	(21)

UNIV. OF ILL.

(B.S. in C.E.)

Bruecker, John Frank	(22)
Cipriano, John Julius	(23)

THE JOHNS HOPKINS UNIV.

(B.E.)

Beery, Robert William	(20)
Davis, Delbert Maurice, Jr.	(20)
Hays, Thomas Archer, V	(23)
Kelly, Keith Austin	(20)
Stegmaier, Joseph Thomas	(20)

UNIV. OF KANS.

(B.S. in C.E.)

Nelson, Myron Kent	(29)

UNIV. OF MAINE

(B.S.)

Tooley, Gordon Kenneth	(22)

MISS. STATE COLL.

(B.S.)

Howard, Robert Burrois	(21)

UNIV. OF MISS.

(B.S. in Civ. Eng.)

Wall, James Dansby	(21)

UNIV. OF NEBR.

(B.S. in C.E.)

Hashimoto, William Kiyoshi	(22)

NEWARK COLL. OF ENG.

(B.S. in Civ. Eng.)

Diamond, Irving Milton	(27)
Geigel, Randolph Winton	(25)
Gilbride, Bernard Francis, Jr.	(29)
Gill, Edward John, Jr.	(28)
Gyongya, George Edwin	(30)
Somma, Domonick Louis	(23)

COLL. OF CITY OF N.Y.

(B.C.E.)

Block, Henry David	(23)
Edwards, Howard Edward	(21)
Franceschi, Renzo	(22)
Grossman, Sam	(21)
Hubchen, Mathew Dietrich	(21)
Solomon, Jacob	(22)
Stolper, Edwin Frederick	(22)
Wolff, Alan Wilson	(21)

UNIV. OF PITTSBURGH

(B.S.)

Cox, Robert Louis	(24)
Dinker, John DeWitt	(29)
McDonald, James Bernard	(21)
Scotti, Anthony Ralph	(22)

R.I. STATE COLL.

(B.S.)

Savi, Jalo Frank	(25)
Slobodian, John	(29)

UNIV. OF S.CALIF.

(B.E.)

Jackson, Melvin Wheeler	(26)

UNIV. OF TENN.

(B.S. in C.E.)

Killebrew, Alfred Buckner	(23)

STATE COLL. OF WASH.

(B.S. in C.E.)

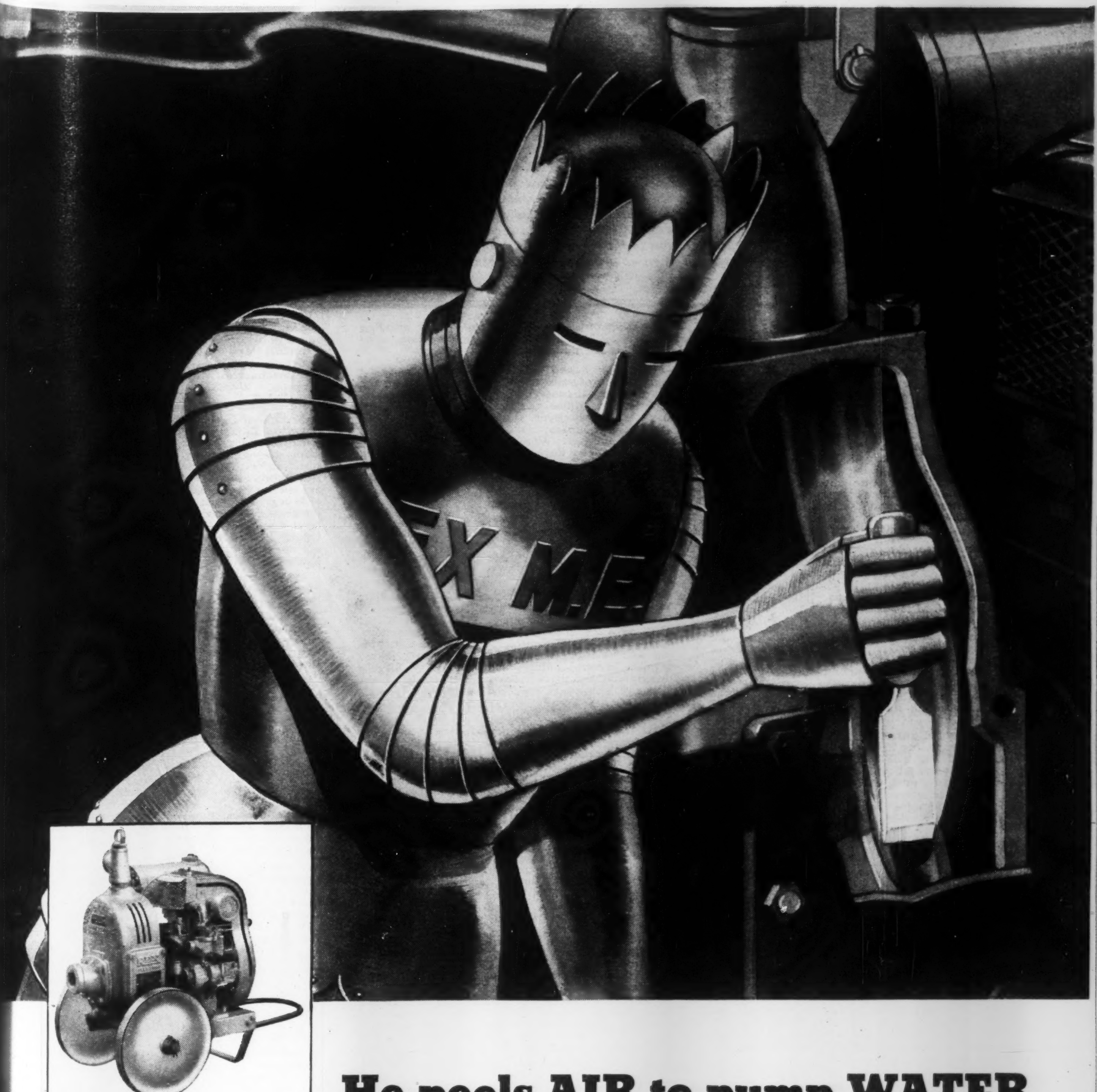
Johnson, Harold Hubert	(21)

WASHINGTON UNIV.

(B.S. in C.E.)

Lemcoe, Meyer Marshall	(22)
Turner, Earl	(25)

The Board of Direction will consider the applications in this list not less than thirty days after the date of issue.



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A weekly bulletin of engineering positions open is available to members of the cooperating societies at a subscription of $3 per quarter or $10 per annum payable in advance.

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Engineer; Assoc. M. Am. Soc. C.E.; age 33; licensed professional engineer; extensive experience on heavy construction work, including large buildings, roads, railroads, pipe lines, airports, and machinery and equipment installations. Draft status, class 3; available immediately. Capable organizer. C-28.

Graduate Civil Engineer; Assoc. M. Am. Soc. C.E.; age 42; 12 years' engineering experience on heavy construction, including hydroelectric power developments, concrete and earth dams, tunnels, navigation locks and highways; 5 years on investigations and studies of proposed dams, plant design and erection. Employed in a responsible position on construction of a power project that is nearing completion. C-29.

Construction Engineer; M. Am. Soc. C.E.; age 39; B.S.C.E.; executive, estimator, and superintendent; 18 years' experience in all phases of heavy engineering and industrial construction, including labor relations and equipment maintenance. C-30-1398-Chicago.

Civil Engineer; M. Am. Soc. C.E.; executive and organizer for 18 years. Industrial experience covering both construction and maintenance of plants and properties. Also railroad location, construction, and harbor improvement. Experienced in the determination of soil bearing values for foundations. Experienced in handling relations between industry and public services. C-31.

Executive Engineer; M. Am. Soc. C.E.; age 45; completing $2^{1}/_{2}$ years as chief engineer of 50-million-dollar TNT, acid and high explosive plant. Previous 20 years on water supply and operation, structural, subways, railroads, municipal, and in contracting business; 17 years as executive or in supervisory capacity. Registered in Illinois, Iowa, Ohio, and West Virginia. C-32.

Graduate Civil Engineer; Assoc. M. Am. Soc. C.E.; 36; 14 years' experience, principally supervisory, on surveys, design, and construction of highways, flood control, industrial buildings, mining developments, housing, water supply, and sewage disposal. Also some aircraft layout and design. C-33.

Civil Engineer; Assoc. M. Am. Soc. C.E.; registered C.E.; 33; capable of taking responsible charge of field and/or office. Twelve years' experience following processing and industrial plants, refineries, and shipyards, including steel and heavy timber structures, docks, shipways, railroads, roads and paving, sanitary and storm sewers, pipe lines, tanks, and pressure vessels and other appurtenances. Speaks Spanish. Will accept foreign work. Latin-America preferred. Salary or contract. Available on December 1, 1943, or January 1, 1944. C-34.

Civil Engineer; Assoc. M. Am. Soc. C.E.; P.E. license, New York State; C.E., Cornell University; 39. Extensive experience on buildings, parkways, and heavy construction as contractor's superintendent and engineer and as resident engineer for consulting firm. At present estimating on current Army and Navy building contracts. Desires permanent connection, construction or maintenance. C-35.

Civil Engineer; Assoc. M. Am. Soc. C.E.; registered professional civil engineer, Texas; age 45; engineer-manager-superintendent; 21 years' experience in office and field on railroad, roads, airports, water, sewer, and buildings; 9 years in government service; now in private business as engineer-builder. Would like connection with firm as representative for heavy construction equipment or building materials in the Southwest area. C-36.

Civil Engineer; Jun. Am. Soc. C.E.; 23; B.C.E., New York University; 1 year of ship-designing experience; 4 years' practical shop training. Desires to gain further experience in field of civil or mechanical engineering with firm having postwar plan of opening branches in China. At present employed but can obtain release upon acceptance. C-37.

Chief Engineer (sanitary and hydraulic); M. Am. Soc. C.E.; 46; registered professional engineer, Florida, Kentucky; B.S.C.E. and C.E.; Tau Beta Pi; married; 22 years' sewerage, hydraulic, and other municipal experience, including writing reports, specifications, and technical articles (several published); experience largely design and executive, some construction; chief engineer $1^{1}/_{2}$ years. Present employer (prominent sewerage commission) dissolving because of completion of work. C-38.

Civil Engineer; Assoc. M. Am. Soc. C.E.; experienced in land-surveying topography, drainage, flood control, water supply, sewerage, irrigation, railroad, engineering, etc. Above age for military service. At present in private practice. Could report for position on short notice. C-39.

Civil Engineer; Jun. Am. Soc. C.E.; 30; B.S.C.E.; licensed professional engineer in New York; wishes executive position or job with opportunity for advancement. Retired army officer with excellent record and in good physical condition; 8 years' varied experience, including structural design, sewerage, and surveying; technical author. C-40.

Positions Available

Sales Engineer, 40–45, experienced in construction equipment industry or qualified to train in construction industry. Will serve as district representatives in given territories in sales-promotion work of construction equipment of manufacture to contractors. Should have outstanding sales ability and be a good mixer. Locations: one is San Francisco for Pacific Coast territory; one in Chicago to cover Central West; one in Cleveland to cover Middle West; one in New York to cover New York State and New England. W-2743.

Civil Engineer, executive, not over 40, experienced in pre-stress concrete design such as bridging, building, frame work, etc. Salary, about $7,200 a year. Location, New York, N.Y. W-2828.

Engineers for a construction program experienced in design work along civil, mechanical, and electrical lines. Also men capable of doing construction drafting—that is, architectural, civil, and mechanical. For the duration. Location, Virginia. W-2837.

Commissioned Officers for the U.S. Navy for duty in the Civil Engineer Corps with the Construction Battalion, up to 50 years of age. Applicants under 35 must have a technical degree from an engineering institution of recognized standing with a specialty in civil engineering. Applicants over 35 may have 10 to 15 years' experience in the field of civil engineering in lieu of a degree. Must meet Naval physical requirements and possess officer-like qualities. Applications should be made to the nearest office of Naval Officer Procurement. These procurement offices are located in principal cities throughout the United States. W-2847.

Instructors to teach civil engineering in Army Specialized Training Program. Location, Florida. W-2909.

Instructor to teach in the department of mechanics and hydraulics. Would teach mechanics, materials, and materials testing for the Army Specialized Training Program. Location, Iowa. W-2910.

Assistant Professor, structural designer with experience in airplane industry for permanent teaching position. Salary, $3,600 for about 9 months' work. Location, Ohio. W-2945.

Transitmen, Rodmen and Chainmen for large construction project; 8 to 10 months' work. Salary open. Location, southern New Jersey. W-2957.

Instructors capable of teaching engineering mechanics or civil engineering subjects to soldiers in the Army Specialized Training Program. Full-time teaching positions. Salary commensurate with qualifications. Location, Pennsylvania. W-2973.

Assistant Structural Engineer, young, with experience in structural design on industrial or factory buildings, steel, reinforced concrete, and masonry. Will be assistant to chief structural engineer for firm of consulting engineers. Permanent with opportunity. Salary, $3,900 a year. Location, Connecticut. W-2992.

Assistant Professor of Surveying for Army Specialized Training Program. Salary, $200–$250 a month. Apply by letter giving complete information. Location, Alabama. W-2995.

Instructors in mechanical, civil, or electrical engineering. Salaries, $2,400–$3,000 a year. Location, New York State. W-3015.

Designer, Civil. Must be able to design steel-reinforced concrete, hydraulic structures, and sewers for sanitary work. Must also be able to create design as well as work on the board. Company also needs draftsmen who will detail designs. Salary open. Temporary, but at least one year's work. Location, northwestern New York State. W-3017.

RECENT BOOKS

New books of interest to Civil Engineers donated by the publishers and filed in the Engineering Societies Library, or in the Society's Reading Room, will be found listed here. The notes regarding the books are taken from the books themselves and are edited by members of the staff of the Society or of the Library. Those books which are in the Library may be borrowed by mail by Society members for a small handling charge.

Aerial Photographs and Their Applications. By H. T. U. Smith. D. Appleton-Century Company, New York and London, 1943. 372 pp., illus., diagrs., charts, tables, maps, $9^{1}/_{2} \times 6$ in., cloth, $3.75.

The major part of this book is devoted to the interpretation of aerial photographs and to map-making procedure, with particular regard to wartime requirements. The topographic and geologic aspects of interpretation receive special consideration, and practical, working procedures are emphasized. The viewpoint assumed is that of the user of aerial photographs, so the technique of taking them is not itself presented.

A.S.T.M. Specifications for Steel Piping Materials, prepared by Committee A-1 on Steel. American Society for Testing Materials, Philadelphia, 1943. 255 pp., illus., diagrs., tables, 9 × 6 in., paper, $1.75 (to members, $1.25).

These specifications cover pipe and tubes for conveying liquids, vapor, and gases at normal and elevated atmospheres, as well as those for the castings, bolts, nuts, and fittings used in piping installations. The specifications are the latest adopted by the Society.

Construction Specifications of the Asphalt Institute. Published by the Asphalt Institute, New York (801 Second Avenue), 1943. 263 pp., 7 × 5 in., cloth.

These Institute specifications are designed to provide broad general standards of acceptable methods and materials for assuring completely satisfactory results. They are not intended for specific jobs, but to serve as guides in developing more detailed specifications having narrower limits of tolerance than is desirable in general specifications.

Encyclopedia of Substitutes and Synthetics. Edited by M. D. Schoengold. Philosophical Library, New York (15 East 40th St.), 1943. 382 pp., tables, $9^{1}/_{2} \times 6$ in., cloth, $10.

This encyclopedia covers products which have been developed recently in order to replace critical materials that have become difficult or impossible to obtain. The properties and uses of these replacement materials are given, the materials needing to be conserved are listed with their practical substitutes, and a separate index of trade names is provided. All branches of industry, manufacture, and pharmaceutics are represented.

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BRIDGES

CONCRETE ARCH. Die Tragende Mitwirkung des Aufbaus bei massiven Bogenbruecken, H. Craemer. *VDI Zeit.*, vol. 87, nos. 23/24, June 12, 1943, p. 354. Supporting capacity of superstructure in masonry arch bridges; assumption that arch alone carries total load, superstructure being purely deadweight, is erroneous; actually arch, face walls, and concrete applied between these form unit with bearing capacity which greatly exceeds that of arch alone. Brief abstract from *Beton u. Eisen*, vol. 40, 1941, pp. 253–267, 275–277.

CONCRETE GIRDER, GREAT BRITAIN. New Waterloo Bridge, E. J. Buckton and J. Cuerel. *Instn. Civ. Engrs.—J.*, no. 7, June 1943, pp. 145–178, (discussion) 178–201. Illustrated description of new bridge on site of old Waterloo bridge; roadway 58 ft wide, two footpaths each 11 ft wide, and five spans each nearly 240 ft clear; structural arrangement and design; materials and construction.

CONSTRUCTION. Stiffleg-Traveler Sets 78-Ton Girders, P. R. Watson. *Roads & Streets*, vol. 86, no. 9, Sept. 1943, pp. 52–53. Lifting of 60 to 78-ton girders into high-level deck, using combination stiff leg and traveler which engaged adjoining bridge span as counterweight, is construction feature on Arroyo Seco Parkway Bridge being completed over Los Angeles River; constructional details.

HIGHWAY, MAINTENANCE AND REPAIR. Keeping Up with Bridge Repairs, F. W. Epps. *Better Roads*, vol. 13, no. 9, Sept. 1943, pp. 17–18, 34. Methods and equipment used by Kansas State Highway Commission; search for materials is pressing wartime activity; repair and replacement of structures taken out by floods or broken down by accidents most serious problem.

PIERS, FOUNDATIONS. Scouring of Foundations as Cause of Bridge Failure, R. Borhek. *Roads & Bridges*, vol. 81, no. 8, Aug. 1943, pp. 33, 50, 52, 54. Suggestions for protection of bridge foundations from flood; causes of washouts; resistance to scour; river-bed maintenance.

PLATE GIRDER. Scrap Turntable Girders Converted Into Bridge Span, S. M. Smith. *Ry. Eng. & Maintenance*, vol. 39, no. 7, July 1943, pp. 511. Gulf, Mobile and Ohio recently converted two second-hand 60-ft turntable girders and number of 15-in. channels salvaged from center sills of dismantled car frames, into 40-ft half-through plate-girder span.

RAILROAD, FAILURE. Masonry Failures and Methods of Repair, E. C. Neville. *Can. Transportation*, Sept. 1943, pp. 449–452. Paper deals with types of failure and methods of repair of masonry substructures of railway bridges. Before Toronto Ry. Club.

RAILROAD, MAINTENANCE AND REPAIR. Refabricates 54 Salvaged Bridge Spans by Welding Methods. *Ry. Eng. & Maintenance*, vol. 39, no. 10, Oct. 1943, pp. 755–756. Article explains how Pennsylvania Railroad reworked spans from abandoned viaduct for heavier duty in new main line structures on its St. Louis division.

STEEL. Low-Water Span Solves Problem, R. E. Schiller. *Better Roads*, vol. 13, no. 9, Sept. 1943, pp. 19–20. Low-water bridge carrying Texas Route 71 across Colorado River at Columbus; total length of structure 457 ft 6 in.; it has six 30-ft steel girder spans, carried on 4-pile steel bents; finished grade line of temporary structure is only 4$^1/_2$ ft above mean low-water elevation; bridge will carry all types of traffic, and will be serviceable for at least 360 days of the year.

STEEL, STANDARD. Erection of Standard Unit Bridge. *Engineer*, vol. 176, no. 4567, July 23, 1943, pp. 74–75. Particulars of erection of bridge having total span of 270 ft; time taken in erection was only 120 hours; only 9 men and 2 boys employed; system uses five standardized parts only, comprising welded box girder for all chord and diagonal members, connecting bobbin for intersection points, cross-girder suspension plate, cross-girder unit, and floor plate.

SUSPENSION, ALASKA. Peace River Suspension Bridge, R. Archibald. *Pac. Bldr. & Engr.*, vol. 49, no. 9, Sept. 1943, pp. 36–37. Construction methods in spanning crossing 37 miles north from Dawson Creek; bridge has main span of 930 ft with loaded backstay spans of 465 ft; two deck-truss spans of 135 ft interposed between cable bents and anchorages; ice conditions in river complicated construction.

SUSPENSION, CABLE REMOVAL. Observations of Bridge Cable Unspinner, C. E. Andrew. *Eng. News-Rec.*, vol. 131, no. 9, Aug. 26, 1943, pp. 347–349. Completion of unspinning operations on Tacoma Narrows Bridge affords opportunity to review difficulties resulting from slack strand, tangling of wires in high winds, high friction caused by many wires that were not parallel, difficulty of identifying wires before cutting and slowing up of pulling by reason of dried paint, dust, and wax that was scraped off as work progressed; solvent was unexpectedly found in ordinary kerosene.

WOODEN, PENNSYLVANIA. River Bridge of All-Timber Construction. *Eng. News-Rec.*, vol. 131, no. 11, Sept. 9, 1943, pp. 390–393. On access road in Pennsylvania, timber bridge consisting of six 129-ft-truss spans with steel gusset plates was constructed across channel of Ohio River; structure is supported on timber piers carried on piles and rock-filled cribs; after cribs were floated into place, corner piles were driven, cribs sunk, and rest of piles put down; trusses were assembled on barges and erected, one at a time, by floating rig.

BUILDINGS

CONCRETE. Concrete Structures House Men and Materials of War. *Concrete*, vol. 51, no. 9, Sept. 1943, pp. 10–11, 20, 22–23, 25. Notes on some of newest of architectural concrete and reinforced concrete buildings erected for both Army and Navy; Pentagon Building; Wright Field structures; Navy structures; dams of TVA.

MARITIME TRAINING CENTERS. Training Centers Constructed on Beach Resort Site. *Eng. News-Rec.*, vol. 131, no. 11, Sept. 9, 1943, pp. 382–387. Training schools and stations for U.S. Coast Guard, U.S. Maritime Service, and medical center for U.S. Public Health Service were established at site formerly occupied by amusement park and summer cottages; fireproof construction adopted, economy being obtained by simple type of concrete block and concrete frame construction; heat provided by power plant in which marine boilers were installed to facilitate training of seamen.

CITY AND REGIONAL PLANNING

LONDON. County of London Plan. *Roy. Inst. Brit. Architects—J.*, vol. 50, no. 9, July 1943, pp. 195–202. Digest of plan, which is designed to retain best features of London and remedy its defects; proposed general layout, housing, and communications discussed.

LONDON. New Plan for London Offers Sane Ideas for American Cities, H. Hoyt. *Am. City*, vol. 58, no. 9, Sept. 1943, pp. 68–69. Brief review of plan of reconstruction prepared by J. H. Forshaw and P. Abercrombie, previously indexed from *Engineering*, July 16 and 23, 1943.

LONDON. Plan for London. *Engineer*, vol. 176, nos. 4566, 4567, July 16, 1943, pp. 46–48, (editorial discussion) 50, July 23, pp. 64–66. Defects of present-day London; objectives of road plan; proposed road system; airports; decentralization of industry; railways and tubes. Extracts from "County of London Plan," MacMillan & Co., London.

POSTWAR. One Postwar Program. *Am. Engr.*, vol. 13, no. 7, Sept. 1943, pp. 8–9, 19. Progress report of Planning Commission of City of New York, indicating that only 30% of plans calling for $700,000,000 construction expenditure remains to be placed in work.

CONCRETE

BEAMS AND GIRDERS. Simplified Equations for Concrete Beams, J. F. P. Tate. *Eng. News-Rec.*, vol. 131, no. 11, Sept. 9, 1943, pp. 388–389. Simplified equations that will speed selection of correct size of concrete beams reinforced for both tension and compression are made available; by use of formulas, designers may quickly prepare tables for concrete similar to those available for steel sections in structural steel handbooks; use of equations is explained by illustrative examples.

CONSTRUCTION. Job Problems and Practice. *Am. Concrete Inst.—J.*, vol. 15, no. 1, Sept. 1943, pp. 61–75. Notes on following problems: Use of Coral Aggregate, B. E. Nutter; Bond in Isolated Footings, T. D. Mylrea; Influence of Sands, Cements, and Manipulation Upon Resistance of Concrete to Freezing and Thawing, F. V. Reagel; How to Determine Relative

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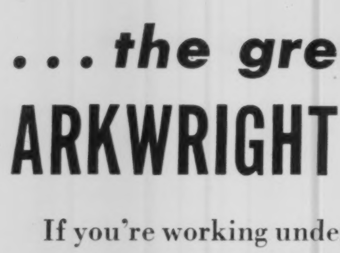

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AMERICA'S STANDARD FOR OVER 20 YEARS

Workability, R. F. Blanks, J. C. Pearson, and T. C. Powers; Vibratory Remolding Test as Measure of Concrete Workability, C. E. Wuerpel.

Construction, Vibrating. Air Tool Adapted to Vibrate Concrete for Ships, P. O. Egner. *Construction Methods*, vol. 25, no. 8, Aug. 1943, p. 65. Curvature of ships sides and weblike structure of steel reinforcing rods required external vibration of concrete; wood forms vibrated by long stroke chipping hammer operated by compressed air; attachments described.

Curing. Membranous Compounds for Curing of Concrete, G. P. Hevenor. *Eng. & Contract Rec.*, vol. 56, no. 31, Aug. 4, 1943, pp. 14–16, 28. Membranous curing gives higher strength concrete and conserves critical materials; curing defined; evaporation loss serious; evaluating efficiency of curing compounds; colorless curing standards; suggested specification.

Design. Reinforced Concrete Corners in Tension, C. J. Posey, and O. Kofoid. *Am. Concrete Inst.—J.*, vol. 15, no. 1, Sept. 1943, pp. 41–52. Many concrete structures have corners which must resist bending moments that cause tension at inside; various ways of placing corner reinforcement for this loading condition are discussed, and results of comparative tests are described, which show that certain new designs are superior to currently standard designs in strength, toughness, and resistance to cracking.

Effect of War. Concrete Technology as Affected by War Conditions, M. N. Clair. *Boston Soc. Civ. Engrs.—J.*, vol. 30, no. 3, July 1943, pp. 169–186. Consideration of WPB regulations regarding concrete, changes in use of concrete, and lessons to be drawn; factors in obtaining high quality concrete; conservation of materials.

Mixers. Tilting-Drum Concrete Mixer. *Engineering*, vol. 156, no. 4047, Aug. 6, 1943, p. 106. Brief illustrated description of mixers manufactured by the T. L. Smith Company of Milwaukee, Wis.; drum is built up of electrically welded sections and is fitted with high carbon steel lining, which can be renewed when worn; electric motor and transmission gear for driving drum are mounted on tilting frame and move with it.

Mixing. Notes on Design of Concrete Mixes, S. D. Lash and J. D. Lee. *Eng. J.*, vol. 26, no. 8, Aug. 1943, pp. 444–448. Method for design of concrete mixes based upon three well-established results; water-cement ratio theory, water-content slump relation, and method of proportioning by absolute volumes; procedure given.

Reinforcement, Conservation. Reinforced Concrete, D. Peabody, Jr. *Boston Soc. Civ. Engrs.—J.*, vol. 30, no. 3, July 1943, pp. 183–186. Trend of design changes in last 15 years; wartime restrictions and effect on building codes.

Reinforcement, Prestressing. Electric Prestressing of Reinforcing Steel Used for Small House Construction, K. P. Billner.. *Eng. News-Rec.*, vol. 131, no. 11, Sept. 9, 1943, pp. 406–408. Prestressed reinforcing for concrete with electric heating for expansion; bars threaded at each end are coated with thermoplastic material and placed in usual manner; after concrete has hardened, low-voltage current is passed through reinforcing bars to heat them to about 250 F above temperature of surrounding material, and nuts on threaded ends are taken up computed amount; cooling of thermoplastic restores concrete bond.

Roads and Streets, Joints. Liquid Asphalt Ends Pumping Action at Joints in Concrete Road Slabs. *Eng. News-Rec.*, vol. 131, no. 9, Aug. 26, 1943, p. 333. Maintenance engineers of Ohio State Highway Department are using liquid asphalt injected under pressure below existing concrete highway pavements to eliminate "pumping action" at cracks and joints; outline of plan followed in treatment.

Roads and Streets, Patching. Concrete for Pavement Patching. *Eng. & Contract Rec.*, vol. 56, no. 29, July 21, 1943, pp. 44–45, 74–77. Step-by-step description of newest methods for road repair with concrete; details of design of patch, preparation of area to be patched, and proportioning, placing, finishing, and curing of concrete.

Tanks. Navy Saves Steel Plate by Building for Fuel Storage Prestressed Concrete Tanks. *Construction Methods*, vol. 25, no. 8, Aug. 1943, pp. 68–69, 72–73, 124, 126, 128–130, 132, 134 136. Illustrated description of construction of fuel-storage tanks with need for steel plate completely eliminated.

FLOOD CONTROL

Protecting Property. How We Beat Flood, E. E. Isgren. *Factory Mgmt. & Maintenance*, vol. 101, no. 9, Sept. 1943, pp. 133–137. Methods used by R. G. Le Tourneau, Inc., Peoria, Ill., to keep plant from being flooded; 1 mile of tarpaulins was replaced; illustrations given.

FOUNDATIONS

Ordnance Plants. Building Foundations on Compacted Fill, W. E. King. *Eng. News-Rec.*, vol. 131, no. 11, Sept. 9, 1943, pp. 403–405. To eliminate need for carrying column footings at varying depths to firm soil and to insure no settlement of ordnance plant floor under heavy loads poor soil was removed and replaced with com-

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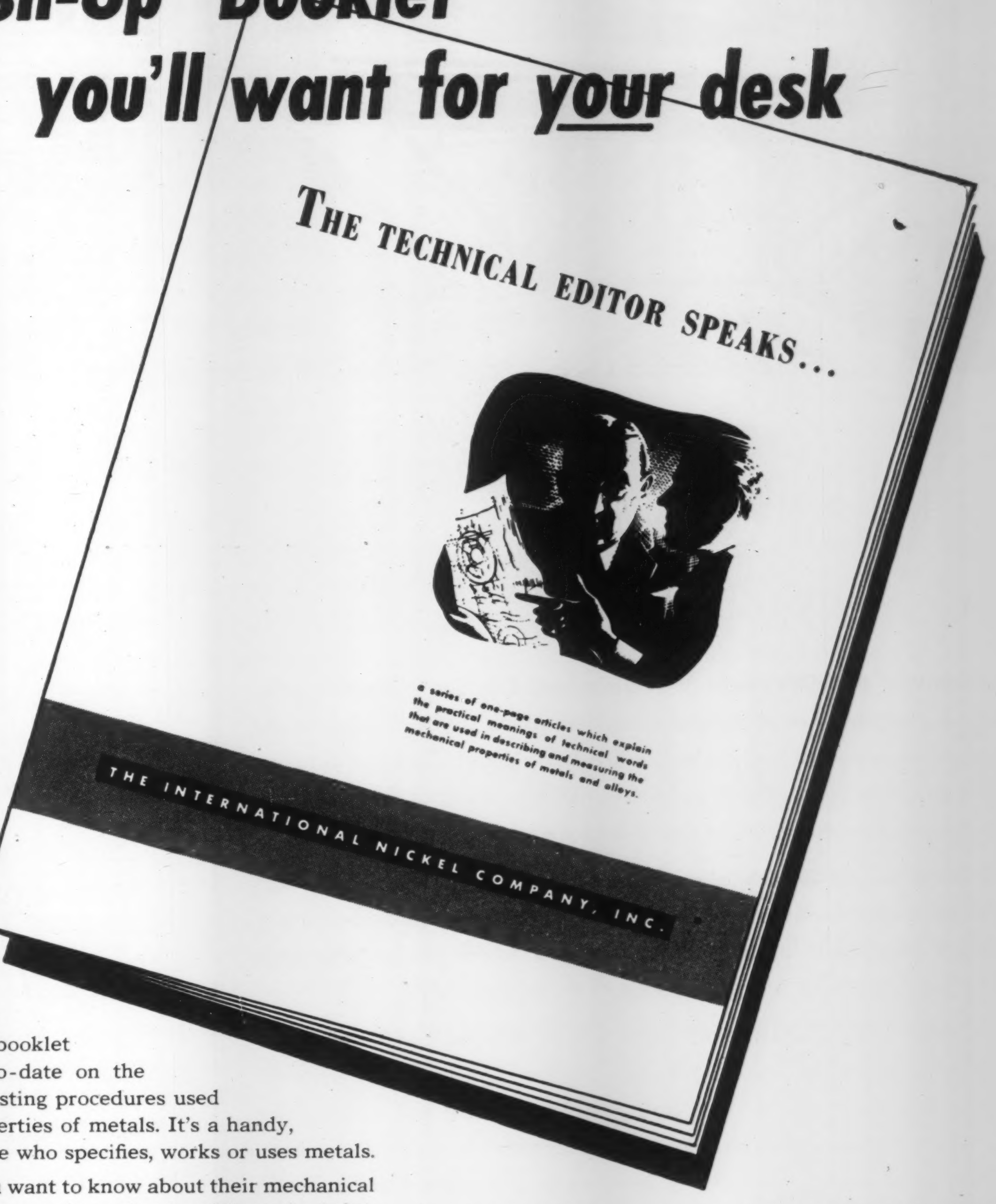

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pacted fill to carry shallow footings and floor slab; success of operation was based on laboratory control of compaction work after complete analysis of fill material.

SOILS, BEARING PROPERTIES. Analogy for Horizontal Forces on Partially Buried Structures, H. M. O'Neil. *Eng. News-Rec.*, vol. 131, no. 9, Aug. 26, 1943, pp. 324–325. When it is necessary to determine lateral bearing pressures on soil around object partially embedded in ground, such as post or pier subjected to lateral force, theoretical assumptions must be made as basis for analysis; based on these assumptions, analogy can be drawn, which simplifies problem, especially when applied to sections of non-uniform width; if width of section is multiplied by triangle of resistance, resulting effective section is obtained.

SOILS, MECHANICS. Experimental Soil Mechanics, R. Allin. *Civ. Eng.* (London), vol. 38, nos. 444 and 445, June 1943, pp. 123–124, July, pp. 147–148. Review of some experiments and conclusions drawn therefrom in soil-mechanics field; distribution and transmission of stress in soils under load; intensity of pressure; structure of clay; relative consistency of undisturbed and disturbed samples of clay.

TOWERS. Design of Foundations for Stacks and Towers, V. O. Marshall. *Petroleum Refiner*, vol. 22, no. 8, Aug. 1943, pp. 251–268. Revision of paper indexed in *Engineering Index*, 1939, p. 1219, from issue of Dec. 1939; both self-supporting and guyed structures are considered; while discussion is based on design of tower foundations, data are also applicable to stacks.

HYDRAULIC ENGINEERING

EDUCATION. Fundamentals of University Hydraulics Education, S. B. Morris. *Am. Water Works Assn.—J.*, vol. 35, no. 7, July 1943, pp. 835–839. Deals with relation between hydraulics and general engineering and suggests first course in hydraulics.

HYDROELECTRIC POWER PLANTS

NIAGARA FALLS. Preservation of Niagara Falls, N. Marr. *Eng. J.*, vol. 26, no. 7, July 1943, pp. 390–397. Measures to preserve scenic spectacle and power potentiality of falls; three conditions affecting scenic beauty and plans to overcome them; plans for power developments; construction of submerged weir; Grass Island gage. Before joint meeting of Am. Soc. Civ. Engrs. and Eng. Inst. Canada.

INLAND WATERWAYS

RIVERS, DIVERSION. River Diversion at Shasta Dam, D. C. May. *Eng. News-Rec.*, vol. 131, no. 11, Sept. 9, 1943, pp. 397–399. Diversion of Sacramento River at Shasta Dam, where flow varies from low of 3,000 cu ft per sec in late summer months to high in spring floods of 185,000 cu ft per sec; conveniently removable cofferdam or gate, designed to be handled by cableways, permitted two slots, left in central portion of dam, to serve alternately as channels for stream flow, while water level was raised in 10-ft steps to diversion-tunnel level.

IRRIGATION

SILT. Notes on Reservoir Silting and Suspended-Load Measurements in Idaho, L. C. Gottschalk. *U.S. Dept. Agric.—Soil Conservation Service—Special Report*, No. 4, Jan. 1943, 16 pp., supp. plates. Reservoir and silting data are discussed for principal drainage basins in Idaho; discussion of each basin includes general description of physical features, summary of known silting data on reservoirs, summary of other sedimentation data that have definite bearing on reservoir silting, and conclusion as to probable extent of reservoir silting in basin.

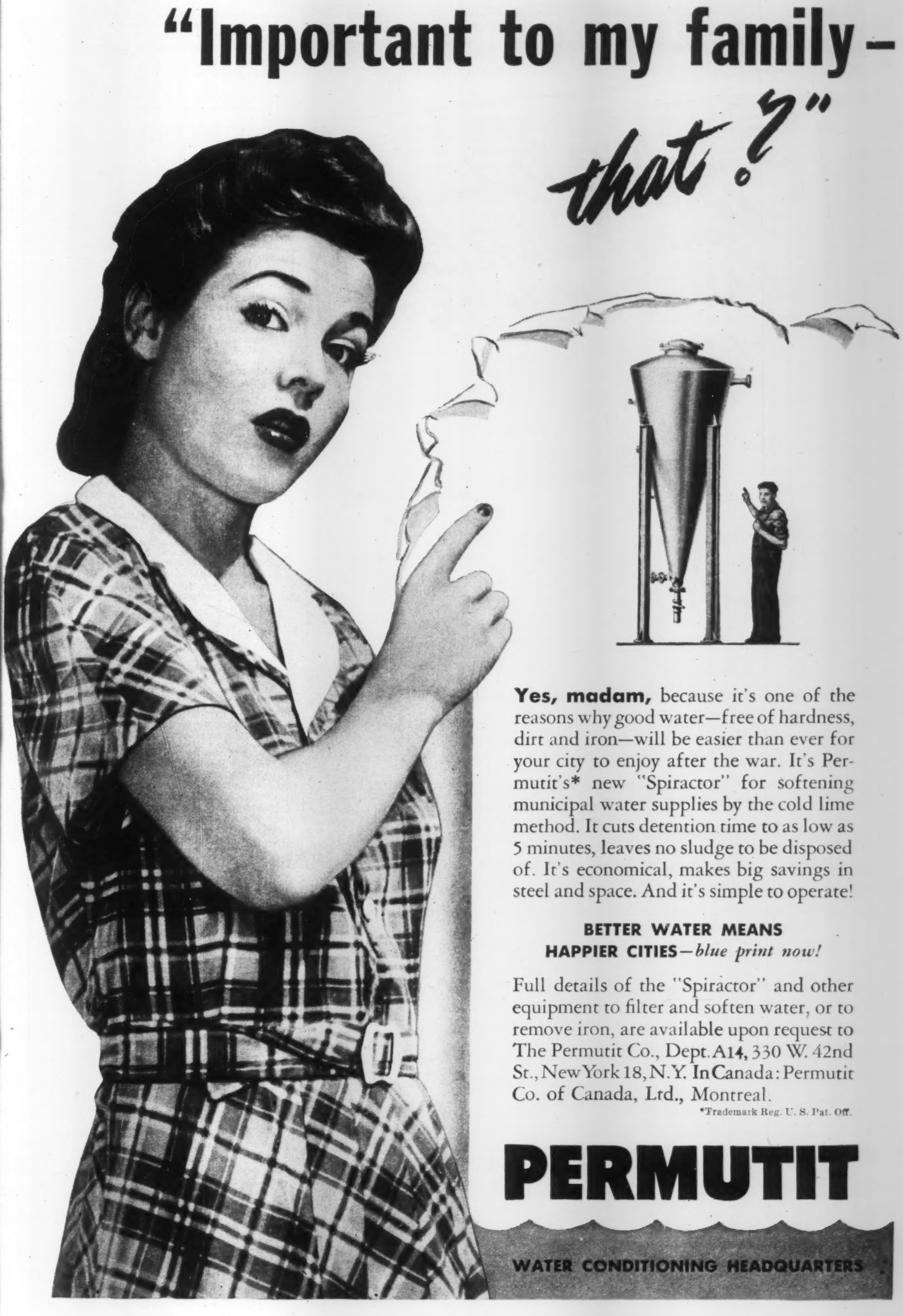
MATERIALS TESTING

ARMY EQUIPMENT. Unique Test Building for Army Equipment. *Eng. News-Rec.*, vol. 131, no. 11, Sept. 9, 1943, pp. 400–402. Experimental laboratory building providing hot and cold rooms for testing mechanized equipment under conditions ranging from those of tropics to arctic has been built for U.S. Army armored force; cold room, which has separate air-conditioning system, has 28-in. thick floor, 20-in. walls, and 20-in. ceiling, including 12 in. of cork all around; walls of hot room are of thinner construction and insulated with mineral wool.

STRENGTH OF MATERIALS. On Torsion Combined with Compression, P. W. Bridgman. *J. Applied Physics*, vol. 14, no. 6, June 1943, pp. 273–283. Report on experiments conducted which show that if bar is twisted, while longitudinal compressive load is applied simultaneously, it will support larger angles of twist and maximum torques greater than possible without load; it is shown that equations of conventional plasticity theory correctly reproduce certain qualitative aspects of secondary longitudinal and radial flow that accompany twisting.

PORTS AND MARITIME STRUCTURES

LONDON. Reconstruction Proposals for Port of London. *Dock & Harbour Authority*, vol. 24, no. 273, July 1943, p. 70. Extract taken from publication issued by Royal Institute of British Architects, entitled, "Greater London Towards



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Master Plan," being second interim report of London Regional Reconstruction Committee, May 1943; new dock facilities.

ROADS AND STREETS

AIRPORT RUNWAYS. How Austin Surfaces Navy Airfields with Soil-Oil, H. H. Edwards. *Pac. Bldr. & Engr.*, vol. 49, no. 7, July 1943, pp. 31–34. Austin Company last fall surfaced satellite landing fields near Pasco Naval Reserve Aviation Base with about one million yd of soil oil mat, 3 in. thick; fields of wartime importance because of speed of construction and economy of manpower; technique is described.

AIRPORT RUNWAYS. Scrapers Move 6 Million Yards at Seattle-Tacoma Airport. *Pac. Bldr. & Engr.*, vol. 49, no. 8, Aug. 1943, pp. 30–39. Sand and hardpan are being moved with scrapers at rate of approximately 32,000 yd per 20-hour day; work is kept to schedule despite inclement weather; seven runways involved; equipment maintenance systematized; manner in which project is being handled.

ALASKA. Some Problems of Road Construction and Maintenance in Alaska, S. Taber. *Pub. Roads*, vol. 23, no. 9, July–Aug.–Sept. 1943, pp. 247–251. Factors affecting road conditions; perennially frozen ground; segregation of water in form of ice during freezing of soils; differential frost heaving; down-slope creep; problems resulting from thawing; burial of highways under ice; floods; Alaska highway.

CONSTRUCTION. Access Road Follows Century-Old Canal Bed, J. A. Byrnes. *Roads & Streets*, vol. 86, no. 6, June 1943, pp. 47–48. Brief description of project which included 2.2 miles of 4-lane dual concrete pavement, four sections of intersecting street at new grade, and five overhead cross-street bridges; old lock masonry removed and gravity-type retaining walls used.

HIGHWAY ENGINEERING, RESEARCH. Keep Research Spark Alive! R. W. Crum. *Better Roads*, vol. 13, no. 9, Sept. 1943, pp. 11–13, 32. Brief commentary on highway research work; place of highway research programs in wartime.

HIGHWAY SYSTEMS, ALASKA. Alaska Highway Will Open Vast New Lands, E. F. Willis. *Eng. & Contract Rec.*, vol. 56, no. 28, July 14, 1943, pp. 10–11, 20–21. Bright postwar future forecast for area traversed by military road; highest elevation only 4,212 ft; reasons for selecting present road summarized; value of highway.

HIGHWAY SYSTEMS, NORTH AFRICA. Land of Four-Arab Tamper, G. C. Ward. *Better Roads*, vol. 13, no. 9, Sept. 1943, pp. 16, 32, 34. Brief note on North African highway system; road construction and maintenance methods are exceedingly primitive, but good system of main highways has been developed.

HIGHWAY SYSTEMS, OHIO. Cleveland Freeways Major Problem, R. C. Chaney. *Roads & Streets*, vol. 86, no. 6, June 1943, pp. 40–44. Brief history and review of Cleveland Freeway Program; reconditioning state's highway system.

HIGHWAY SYSTEMS, PAN-AMERICAN. Building Inter-American Highway, A. N. Carter. *Eng. News-Rec.*, vol. 131, nos. 5, 7, 9, July 29, 1943, pp. 209–222; Aug. 12, pp. 269–276; Aug. 26, pp. 339–346. Account based on author's six-week sojourn on project, July 29: History, surveys, access, and housing. Aug. 12: Grading, constructing bridges and culverts, and surfacing road with crushed stone or gravel to make it adequate for military traffic in Guatemala, El Salvador, Honduras, and Nicaragua. Aug. 26: Construction in Costa Rica and Panama.

HIGHWAY SYSTEMS, PAN-AMERICAN. Inter-American Highway Nears Completion. *Pac. Bldr. & Engr.*, vol. 49, no. 7, July 1943, pp. 37–38, 40. Outstanding example of cooperation between several nations in constructing highway of mutual benefit is furnished by Inter-American Highway, which is that section of Pan-American Highway located in Mexico and Central America; road will furnish United States overland route direct to Panama Canal; progress up to Apr. 1943, is related in statement prepared by Public Roads Administration.

HIGHWAY SYSTEMS, POSTWAR. Highway Construction Can Bridge Postwar Gap, C. M. Upham and D. R. Lamson. *Eng. & Contract Rec.*, vol. 56, nos. 28, 32, July 14, 1943, pp. 12–15, 24, and Aug. 11, pp. 24–28. Extracts from study on postwar highway planning prepared by Am. Road Bldrs.' Assn., previously indexed from *Highway Mag.*, July-Aug. 1943.

HIGHWAY SYSTEMS, UNITED STATES. Highway Program During and After War, T. H. MacDonald. *Constructor*, vol. 25, no. 7, July 1943, pp. 104–107. Problems and methods of solving them.

INTERSECTIONS. Improved Road Crossings. *Transport World*, vol. 94, no. 3003, Aug. 12, 1943, pp. 130–134. Consideration of design and layout most appropriate to various types of roads in built-up areas; new designs of road crossings illustrated include clover-leaf design, and "maltese crossing"; disadvantages of roundabouts.

JOINTS. Preventing and Correcting Pumping Action of Concrete Pavement Slabs. *Roads & Bridges*, vol. 81, no. 8, Aug. 1943, pp. 29–30, 66–70. Recommendations put forward by Highway Research Board, Washington, D.C., are general and need not be restricted to wartime practice as they are applicable whenever described conditions prevail; causes of pumping; prevention; correction; materials; testing soil and soil mixtures. Bibliography.

MAINTENANCE AND REPAIR. Minimum Wartime Requirements for Highway Maintenance, B. A. McDonall. *Inst. Engrs. Australia—J.*, vol. 15, no. 5, May 1943, pp. 115–120. Problems that local government and highway engineer meet every day, and review of changed conditions that obtain today and of how engineer in charge of road maintenance, might adapt himself to changed outlook; indication of some maintenance practices to meet wartime emergency.

MAINTENANCE AND REPAIR. Salvaging Rigid-Type Pavements. *Roads & Bridges*, vol. 81, no. 8, Aug. 1943, pp. 31–32, 60–61. Abstract of report to be published by Highway Research Board, Washington, D.C., embodying recommendations of its subcommittee on salvaging old rigid-type pavements, as presented at last annual meeting of board; patching methods recommended.

MAINTENANCE AND REPAIR, COUNTRY ROADS. County Road Problems in "North Country," K. I. Sawyer. *Roads & Streets*, vol. 86, no. 6, June 1943, pp. 45–46. How county highway department helps serve vital logging, charcoal, and mining industries in northern Michigan; brief description of road maintenance program.

MAINTENANCE AND REPAIR, WEST VIRGINIA. Maintaining West Virginia's Roads Under War Restrictions, E. L. Worthington. *Roads & Streets*, vol. 86, no. 6, June 1943, pp. 54–55, and 77–81. Outline of maintenance methods used on West Virginia's road system; methods and devices developed to reduce over-all maintenance expenditures; salvage methods.

SNOW AND ICE CONTROL. Live Snowbreaks in Pennsylvania, H. C. Ferguson. *Better Roads*, vol. 13, no. 9, Sept. 1943, pp. 21–22. Methods used by Pennsylvania Dept. of Highways in controlling and preventing drifting of snow; natural fencing consisting of permanent rows of deciduous and evergreen trees and shrubs found to be economical and practical method of controlling drifts; two-row barrier most widely used.

SOIL CEMENT. Step-by-Step Photos of Street Job, G. C. Stanley. *Roads & Streets*, vol. 86, no. 6, June 1943, pp. 51–53. Pictorial presentation, with brief descriptive data, of surfacing of

2,000 ft of outlying residential and lake resort streets, with soil cement, as carried out in city of Burlington, Vt.

SANITARY ENGINEERING

Argentina. Obras de Saneamiento de las Ciudades de Gualeguaychu, Gualeguay y Victoria, H. Albertelli. *Boletin de Obras Sanitarias de la Nacion*, vol. 7, no. 71, May 1943, pp. 842–858. Sanitation work in cities of Gualeguaychu, Gualeguay, and Victoria, in Province of Entre Rios, Argentina; review of installations of water service and sewers in cities of province; descriptions of projects.

Ontario. Postwar Prospects in Water and Sewage Treatment Fields, A. E. Berry. *Eng. & Contract Rec.*, vol. 56, no. 29, July 21, 1943, pp. 46–47, 98. Survey by Ontario Department of Health reveals $40,000,000 program of water and sewage-plant construction; sewer rental; developments in equipment and methods; future objectives; water standards; sewage treatment; incineration of refuse; financial aid to municipalities.

SEWERAGE AND SEWAGE DISPOSAL

Activated Sludge. Pickle Liquors Fail to Upset Activated Sludge Operations. *Sewage Works Eng. & Mun. Sanitation*, vol. 14, no. 8, Aug. 1943, pp. 364–346. Tables presenting operation data and results for 1941 in plant at Gary, Ind., include solids in mixed liquor, sludge index, quality of return sludge and amount wasted; aeration data and secondary settling operations; air consumption figures; short description of treatment units.

Biochemical Oxygen Demand. Mathematics of B.O.D. Determinations, H. M. Gifft. *Water Works & Sewerage*, vol. 90, no. 8, Aug. 1943, pp. 313–315. Equation proposed for calculating proper dilution to be made; examples given of other B.O.D. equations.

Biofiltration Process. Ideal Biofilter Plan, Design and Operation. *Eng. & Contract. Rec.*, vol. 56, no. 34, Aug. 25, 1943, pp. 14–16. Data obtained from over 200 biofiltration plants in use at municipal and military installations in United States and Canada, provides preferred single and 2-stage flowsheets; from information it is possible to draw broad conclusions regarding ideal biofilter plant design for varying conditions and practical workability of plants themselves.

Camps, Military. Sewage and Sullage Treatment at Small Army and Air Force Camps, H. J. N. Hodgson. *Inst. Engrs. Australia—J.*, vol. 85, nos. 5 and 6, May 1943, pp. 101–110, June, pp. 125–133. Wastes to be treated, various trapping devices adopted at camps, and sewage-flow measurements for various camps; describes several sewage treatment plants built, and gives few of basic figures used in their design, together with chemical and bacteriological analyses of effluents from such plants; brief discussion on elements of sewage treatment as applying to army and air-force treatment plants discussed.

Grease Removal. Rapid Method for Determining Grease in Sewage and Sludges, H. W. Gehm. *Water Works & Sewerage*, vol. 90, no. 8, Aug. 1943, pp. 305–308. Presents new method for determining grease in sludge by oil extraction; other methods; tests and results; technique of new method; application of method to sewage; equipment required. Bibliography.

Industrial Wastes. Effect of War and Postwar on Sewage Treatment. *Sewage Works Eng. & Mun. Sanitation*, vol. 14, no. 8, Aug. 1943, pp. 372–374. Necessity for sacrificing clean stream program for war production; manufacture of ethyl alcohol is causing stream pollution because of lack of critical materials for waste-recovery equipment; wastes in Illinois industries: corn, cheese, petroleum.

Low-Cost Disposal, War Plant. Low-Cost Sewage Treatment Facilities for War Plant. *Eng. News.-Rec.*, vol. 131, no. 9, Aug. 26, 1943, pp. 350–352. Sedimentation and two-stage sludge-digestion facilities were selected to treat sanitary sewage from ordnance plant employing 4,500 people; features of plant were its low cost, speedy construction, and simplicity in operation.

Municipal Engineering. Sewage Purification and Municipal Engineer, N. H. Stockley. *Surveyor*, vol. 102, no. 2682, June 18, 1943, pp. 251–253. Problems which are likely to confront municipal engineer in connection with works of sewage purification; storm water separation; detritus tank design; types of screens; settlement tanks; mechanical desludging; bacteria bed wall construction. Before Instn. Municipal & County Engrs.

Ohio Conference. Ohio Conference on Sewage Treatment, G. E. Symons. *Water Works & Sewerage*, vol. 90, no. 8, Aug. 1943, pp. 309–312. 17th Annual Conference, June 23, discussed changes in composition of sewage at Akron plant, sampling problems and methods, activated sludge, problems of handling sludge, plant operation and coordination, sewerage priorities, Army sewage treatment program, sewage treatment processes and results.

San Diego, Calif. Sewerage in San Diego for National Defense, H. Keen. *Am. City*, vol. 58,

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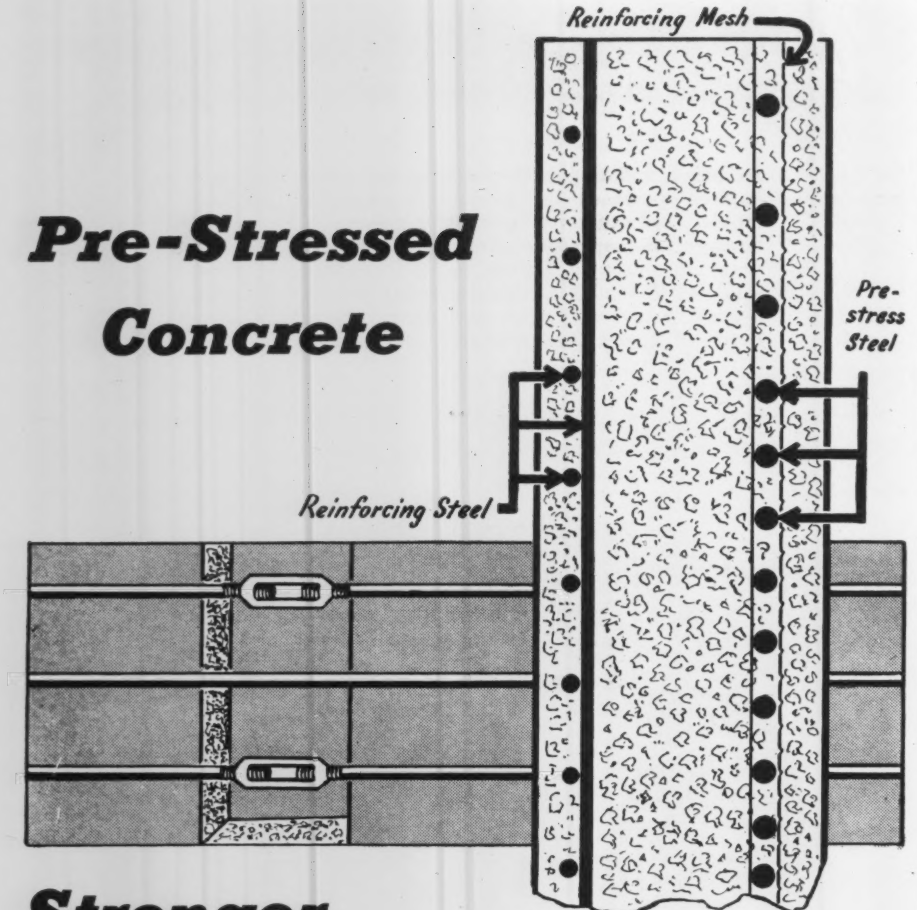

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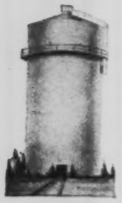

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no. 9, Sept. 1943, pp. 56–58. Description of sewage treatment plant capable of serving 425,000 people; plant removes corrosive sulfuric and hydrochloric acids that had been causing serious damage to destroyers based here; this is first municipal plant in United States to use vacuators for removal of grease and suspended solids; also incorporates sludge elutriation, filtering with ferric chloride produced by Scott Darcy process, and flash drying for fertilizer production.

Sewage Filters, Trickling. Percolating Bed Material, H. H. Goldthorpe. *Civ. Eng.* (London), vol. 38, no. 445, July 1943, pp. 154–156, 158. Examination of material to ascertain what happens when settled sewage trickles through medium of percolating bed; surface area and voids; distribution; time of contact; oxygen demands of suspended solids. Abstract of paper before Inst. of Sewage Purification.

Sewage Tanks, Cleaning. Cleaning Diffuser Plates in Treatment Plants. *Sewage Works Eng. & Mun. Sanitation*, vol. 14, no. 8, Aug. 1943, pp. 379–380. Round-table discussion on methods of cleaning diffuser plates in various treatment plants.

Sludge Digestion. Review of Developments in Sludge Digestion Processes, D. L. McLean. *Eng. & Contract, Rec.*, vol. 56, no. 34, Aug. 25, 1943, pp. 17, 25–26. Modern trends reviewed; details of process of sludge digestion; action of bacteria; introducing methane fermentation; controllable factors; temperature; reaction of hydrogen ion concentration; counteracting acid conditions; war has increased loads.

STRUCTURAL ENGINEERING

Columns, Wooden. Critical Review of C.S.I.R. Timber Column Formula, D. A. Morelli. *Inst. Engrs. Australia—J.*, vol. 15, no. 6, June 1943, pp. 135–138, (discussion) 138–139. Controversial points in timber column formula, widely promulgated in Handbook of Structural Timber Design, Issued by Council for Scientific and Industrial Research; in this book, the three formulas for design contain term which is supposed to provide for creep of timber under load, and in two of these creep term is erroneous.

Industrial Plants, Design. Rigid-Frame Concrete Industrial Plant, A. F. Plant and S. J. Deitrick. *Eng. News-Rec.*, vol. 131, no. 9, Aug. 26, 1943, pp. 334–338. Concrete rigid frames of 100-ft span prove economical in magnesium alloying war plant; absolute fireproofing is secured throughout manufacturing building by eliminating all windows, while elaborate ventilating system disposes of intense heat and strong gases generated during manufacturing processes; hollow, pre-cast concrete roof slabs permit speedy erection during cold weather and effect considerable saving in form lumber.

Photoelasticity. Introduction to Theory of Photoelasticity and Its Application to Problems of Stress Analysis, R. E. Arthur. *Roy. Aeronautical Soc.—J.*, vol. 47, no. 392, Aug. 1943, pp. 263–272. Photoelastic method is based upon fact that transparent materials when stressed undergo changes in their optical properties which can be measured and related to applied stress; optical arrangement used is called polariscope; paper gives, with aid of illustrations, clear physical picture of plane polariscope and circular polariscope.

Roof Trusses. Two-Hinged Timber Roof Trusses Use "Synthetic" Gusset Plates. *Eng. News-Rec.*, vol. 131, no. 11, Sept. 9, 1943, pp. 410–411. To save critical materials and, particularly, because structural plywood was not available for gussets, roof is carried on arches of 50-ft span built up with timbers of standard sizes; gussets consist of 4 by 4's set side by side and keyed together by mortised shear blocks.

Stresses. Philosophy of Stress Concentrations, C. F. Koerner. *Inst. Engrs. Australia—J.*, vol. 15, no. 5, May 1943, pp. 111–114. Philosophical aspects of concept of "stress concentration" used in engineering design; circumstances under which it is permissible to ignore such concentrations are given special attention; paper also shows how consideration of stress concentrations leads to method of limit design.

Structural Design. Cross Beams and Load Distribution, J. Ratzersdorfer. *Civ. Eng.* (London), vol. 38, no. 445, July 1943, pp. 149–150. Formulation of problem and method of calculation; illustrative examples.

Vibrations, Damping. Vibration Absorption with Structural Rubber, J. W. Devorss, Jr. *Louisiana Eng. Soc.–Proc.*, vol. 29, no. 3, June 1943, pp. 105–118. Application of structural rubber—that is, load-supporting rubber used as mechanical building material—to insulation of objectionable mechanical vibration; mechanical fundamentals of vibration absorption discussed; static properties of rubber; physical characteristics necessary for structural design; use of structural rubber in shear and in compression. Before joint meeting of Louisiana Eng. Soc. and Am. Soc. Mech., Feb. 8, 1943.

TUNNELS

English Channel. Channel Tunnel, W. C. Sutcliffe. *Transport World*, vol. 94, no. 3003,

Wartime progress

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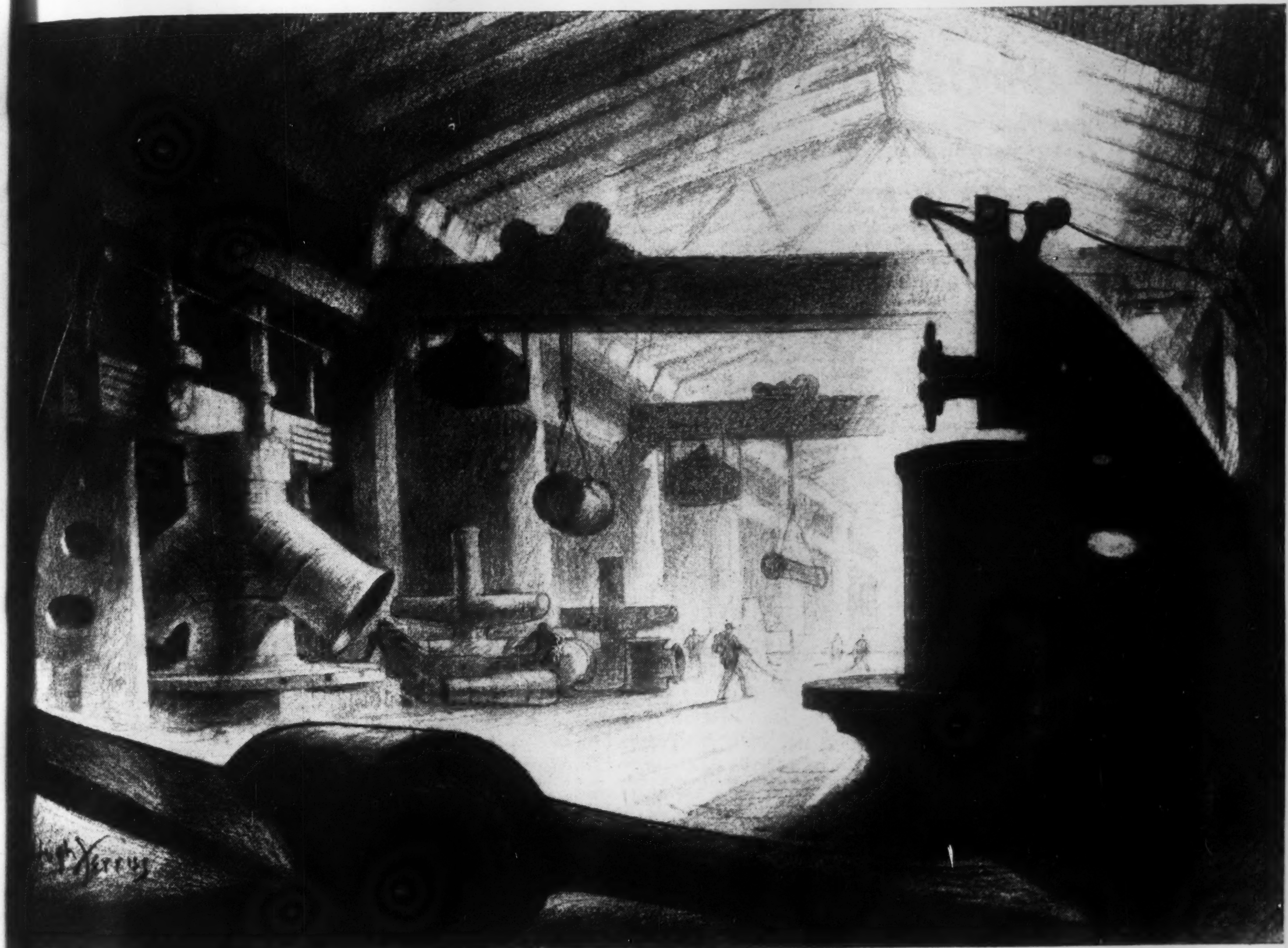

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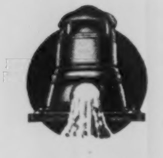

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WELL WATER SYSTEMS

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Aug. 12, 1943, pp. 136–138. Hopes of tunnel connecting Dover and Calais and linking England and France are by no means dead; question was asked in Parliament recently, but official reply was that no new plans could be made except in cooperation with authorities who ruled on other side of channel; author reviews position briefly and predicts that project will be realized within 30 years.

VEHICULAR. Pioneer Highway Tunnels Modernized for Service. *Eng. News-Rec.*, vol. 121, no. 9, Aug. 26, 1943, pp. 326–329. Twin, 5,889-ft-long Liberty Tunnels at Pittsburgh have been modernized by new drainage system; new roadway slabs; 9-ft-high glazed tile lining at each side; new lighting; improved approaches, and new carbon monoxide recorders; work continued 13 months and required that tubes be shut down for several months but not concurrently.

WATER PIPE LINES

BACKFLOW PREVENTERS. Air Gaps and Backflow Preventers in Plumbing Systems. *Am. Standards Assn.—Am. Standard A40-4—1942, A40.6—1943*, 14 pp. Sponsors: Am. Pub. Health Assn. and Am. Soc. Mech. Engrs. Standard specification for air gaps in water-distribution piping system, for plumbing fixtures, and for all water-connected devices, which can be policed in field without complicated measurements or necessity of applying involved mathematical formulas; also recommended construction, installation, and performance requirements and tests of safe backflow preventers.

COLD WEATHER PROBLEMS. How Dawson Keeps Its Water Mains from Freezing, I. M. Reed. *Pac. Bldr. & Engr.*, vol. 49, no. 8, Aug. 1943, p. 54. Water is preheated at source by electricity; each home keeps small valve running continuously in cold weather; pipe lines only 2 ft below surface.

DESIGN. Computation of Flows in Distribution Systems, W. Gavett. *Am. Water Works Assn.—J.*, vol. 35, no. 3, Mar. 1943, pp. 267–287. Survey methods, such as Freeman, slide rule, circle, hydraulic grade, Hardy Cross; formula for pipe flow; analysis of pipe flow with orifices. Bibliography.

FLOW OF WATER. Identical Value Method for Solving Simple Pipe-Flow Problems, A. A. Hirsch. *Am. Water Works Assn.—J.*, vol. 35, no. 3, Mar. 1943, pp. 288–294. Explanation of method; principles and applications; volume of pipe line or tank, velocity of flow in pipe lines, orifice discharge, theoretical pump horsepower, over-all pumping efficiency, pipe friction.

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CONSERVATION. A.W.W.A. to Cooperate in U.S. Conservation Program. *Water Works Eng.*, vol. 96, no. 17, Aug. 25, 1943, pp. 938–939. Statement of policy: objectives; nature of water conservation program; general plan of campaign; conservation-control measures; publicity media; publicity manual; promotion of regional activity; report of results attained.

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CAMPS, MILITARY. Water Supply Practice in Army Training Centers, L. H. Kessler, V. B. Sundstrom and A. O. Tomek. *Water Works Eng.*, vol. 96, no. 17, Aug. 25, 1943, pp. 930–934, 950–952. Problems of operation and maintenance of systems; purchased, ground-water, and surface supplies; distribution systems; disinfection policy; tests and treatment by categories.

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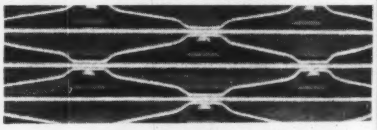

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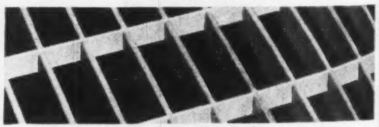

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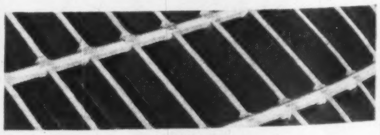

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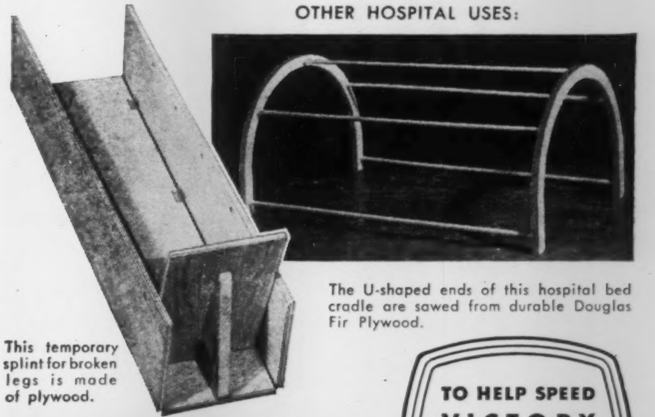

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tan River, treated daily for use in production of chemical materials by Calco Chemical Division of American Cyanamid Co.; equipment and method of treatment described; specifications for finished water and tests; treatment of cooling ponds.

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ARGENTINA. Las Obras Para Proveer de Agua Potable a Recreo, H. Mase. *Boletin de Obras Sanitarias de la Nacion*, vol. 7, no. 70, Apr. 1943, pp. 758–762. Water works of town of Recreo, in Province of Catamarca, Argentina; population about 3,000; water had been brought from 48-m well, 30 km distant, and distributed by tank wagon; two deep wells at point 9 km distant supply water of good quality from depths 222 to 253 miles; distribution system has total of 4.695 m of asbestos cement pipe in four sizes, 5 to 15 cm in diameter.

CALIFORNIA. Lazy Man's Water Works, G. L. Wood. *Am. Water Works Assn.—J.*, vol. 35, no. 3, Mar. 1943, pp. 303–308. Paper describes system of Bishop, Calif.; source is mountain stream flowing downhill and fed by snow waters; daily per capita consumption 350 gal.

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GREAT BRITAIN. Public Water Supply. *Elec. Rev.*, vol. 132, no. 3418, May 28, 1943, pp. 707–710. Article describes, from electrical viewpoint, layout and plant of entirely new scheme for town water supply; water is drawn off at level of 2 ft below lowest known summer level of river, and pumphouse floor is at level of 3 ft above highest recorded flood level; pumps, river-level indicator, and treatment equipment are electrically operated.

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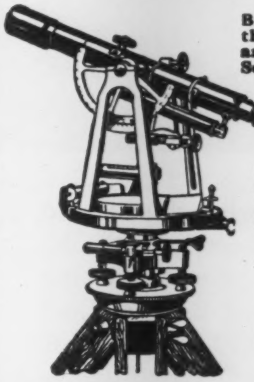

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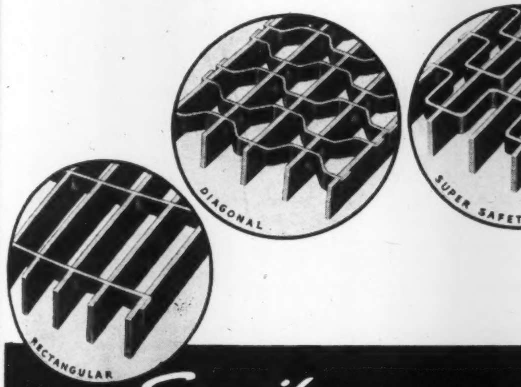

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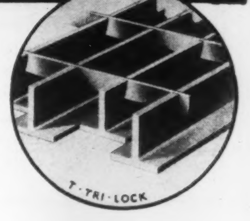

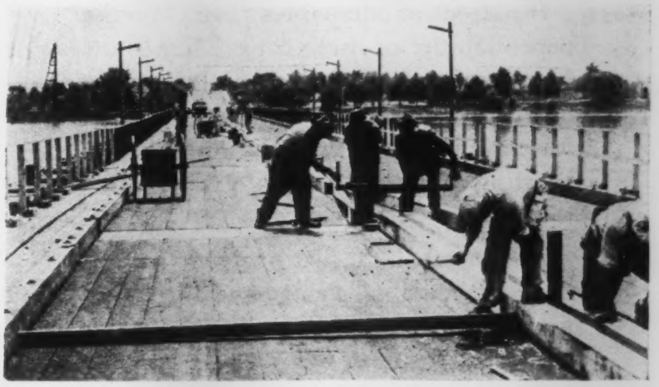

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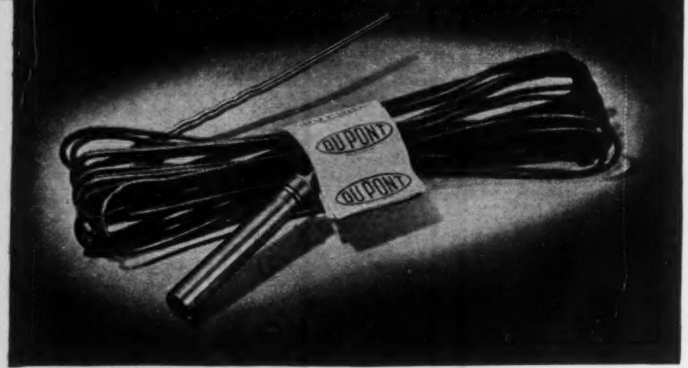

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Among Our Writers

W. N. Carey (U. of Minn., '13) saw service in France in 1918–1919 as a major of Engineers. After a period in consulting work, he became asst. city engr., later city engr., of St. Paul. In 1933 he headed the PWA office in Minnesota. Colonel Carey is now in the Corps of Engineers as Chief Engineer, Federal Works Agency.

C. S. Duncan (Wabash College; U. of Chicago, Ph.D.) has been studying transportation problems for the past 20 years. After experience abroad with the Amer. Shipping Mission and the U.S. Shipping Board, in 1922 he became Economist for the Assoc. of Ry. Executives, and in 1934 Economist for the newly organized Assoc. of Amer. Railroads. He is the author of several books and numerous articles.

Charles Mackintosh (Colo. College, B.S. '33, M.S. '34; Calif. Inst. of Tech., M.S. '39) had experience in steel and concrete before specializing in the design of large timber structures as chief engineer of a timber fabricating company. He is now a partner in Mackintosh & Mackintosh, consulting engineers. During 1942 and 1943 he conducted courses in Engineering in Timber for the California Institute of Technology.

R. E. Martin (Case School of Applied Science '28), before he became connected with the Tennessee Valley Authority, was engaged in lock and dam construction work on the Ohio, Allegheny, and Mississippi rivers, for private contractors. He is now Construction Plant Job Engineer on the Fontana Project, TVA.

Arthur Taylor (Stanford U., C.E., '12) has been in private practice since 1922 in the general civil, hydraulic, and sanitary field except for a year in the Army overseas, World War I, as Captain, Engineer Corps. He is now a member of the firm of Taylor and Taylor.

Nelson Taylor (Stanford U., C.E. '11) has been in private practice in the general civil and hydraulic field since 1914, except for 2 years in the Navy in World War I as Lt. Comdr. He is now a member of the firm of Taylor and Taylor, consultants.

L. E. Brigham (Colo. State College, C. and I.E. '13) has had many years of direct dealing with labor in both heavy and building construction. Under the Quatermaster General in the summer of 1940, he organized the Labor Relations Section and developed basic labor policies for War Dept. work.

Karl Terzaghi (Technische Hochschule, Graz, Austria, '04), now a lecturer at Harvard U., has acted as consultant on important projects for dams and foundations in many parts of Europe and Asia, in North Africa and in the U.S.A. He is the author of several books and many professional papers on his subject, soil mechanics.

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December 1943

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KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK • PHILADELPHIA • ST. LOUIS • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 25-MILLION BARRELS ANNUAL CAPACITY

MONOTUBES

Promise Better Foundations for the World of Tomorrow

Before PEARL HARBOR, leading engineers and building contractors made wide use of Union Metal's light, rugged, tapered Monotubes for fast, low-cost installation of cast-in-place concrete piling.

Today, with all of our energies devoted to the Nation's victory effort, Monotubes are being produced only for the construction of war-essential projects.

Tomorrow, however, Monotubes again will be available to all—in any quantity.

So, when next you build, whether for a war plant today or a peacetime structure tomorrow, remember that underneath the best jobs are Monotube Foundations.

4 Reasons for Specifying Monotubes

1. Monotubes are light in weight for fast and economical handling.

2. Monotubes are strong and rigid—require no heavy core or mandrel—can be driven with average job equipment.

3. Extendible Monotubes permit speedy installation of varying pile lengths without delay or waste even in low headroom.

4. Hollow, tubular design of Monotubes enables you to inspect casings quickly and thoroughly from top to toe before concreting.

Monotubes are available in a gauge, size and taper to meet the most exacting requirements in any soil condition. Write for Catalog 68A.

THE UNION METAL
MANUFACTURING COMPANY • Canton, Ohio

"THIS YEAR, LET'S PAY THE BONUS IN WAR BONDS

. . . and drive even harder on the pay-roll savings plan!"

Make War Bonds the Christmas Order of the Day. Urge your workers to make their personal Christmas gifts in the form of War Bonds—and practice what you preach! Make this a 100% War Bond Christmas—to insure future Yuletides of peace and prosperity.

Make up your own posters to spread the "War Bonds for Christmas" story across your plant. Tell the story again and again on bulletin boards, in your plant magazine, and on pay envelope stuffers.

But don't forget your basic, all-important Pay-Roll Savings Plan. How's it going, these days? Perhaps it needs a bit of stoking-up right this very minute, to hold its full head of steam against the competitive demands of the holiday season.

Well, you're the man to stoke it! You can't expect it to keep running indefinitely on last summer's enthusiasm. See to it that your participation percentages, and your deduction percentages, *both* end up the year at new levels.

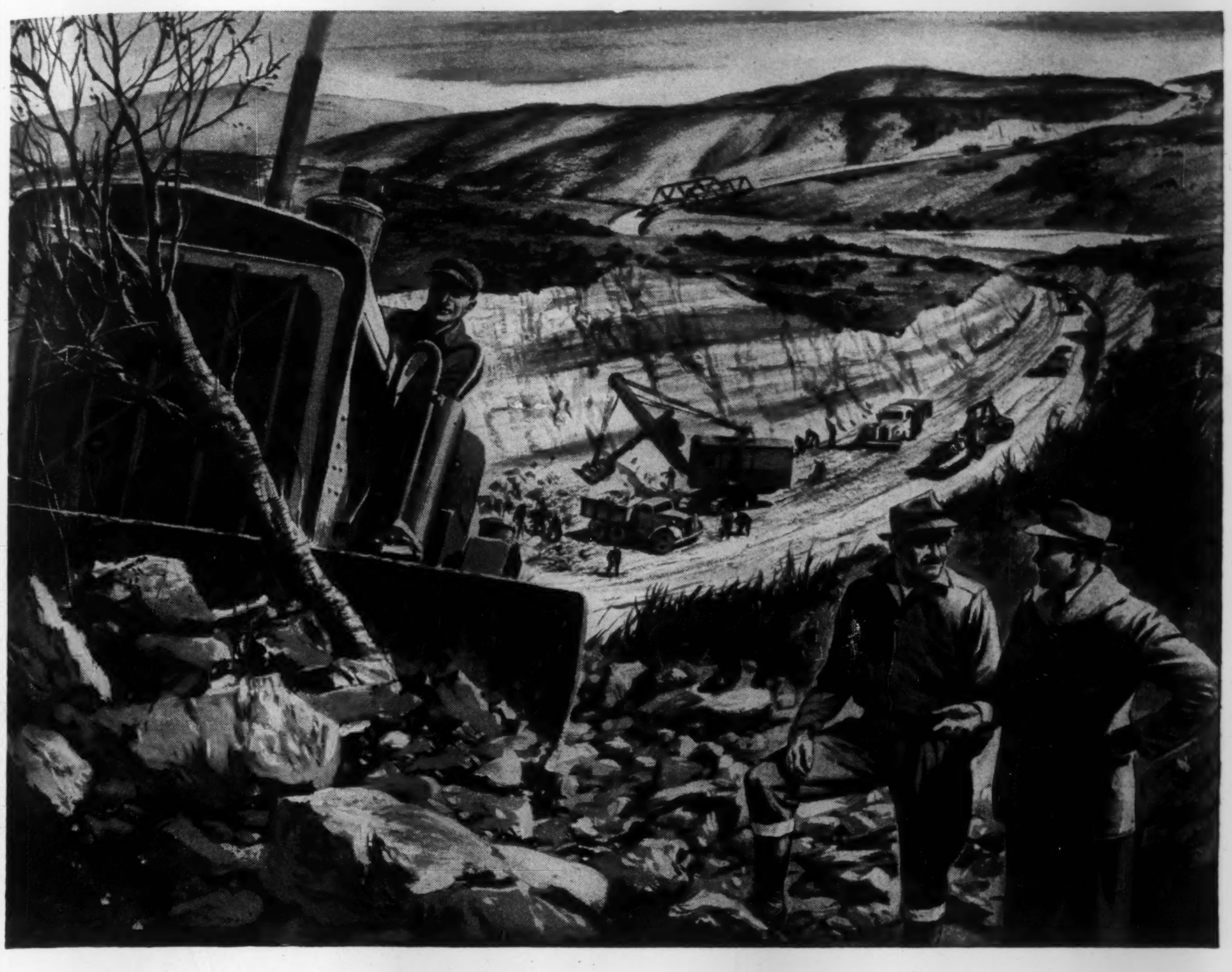
Every month, now your Pay-Roll Savings ought to run well ahead of the preceding month. *For so many families that formerly depended on the earnings of a single worker, now enjoy the combined earnings of several.* Such *family* incomes are doubled, trebled, even multiplied many times.

Now's the time to turn as much as possible of these increased earnings into War Bonds—War Bonds for Christmas . . . and War Bonds the whole year 'round!

GIVE THE PRESENT WITH A FUTURE—WAR BONDS!

This space contributed to Victory by CIVIL ENGINEERING

[illegible] Council



NICKEL AIDS THE CONSTRUCTION INDUSTRY

to KEEP 'EM WORKING!

Engineers who design construction equipment can take pride in the construction industry's greatest achievement...its part in building America's "Arsenal of Democracy."

For they contributed to that amazing success, even long before the war started. They designed the tools with which the job was done...found ways to make equipment durable, and thus prevented many a breakdown of machinery at this critical time when nothing must interfere with the drive toward Victory.

Familiar to them, as a means of giving longer life to construction equipment, is the widespread use of Nickel Alloys. Those engineers have learned from long experience that Nickel imparts toughness, strength, and corrosion resistance to ferrous and non-ferrous metals, and thus assures improved performance under the most severe conditions.

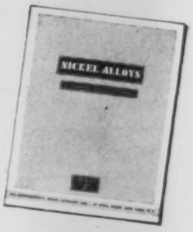
Among them, as with men in many other industries, the saying is that "a little Nickel goes a long way" toward increasing dependability of machine parts—from gears to scraper blades, from dipper teeth to crusher rolls.

The experience of contractors, engineers, and machine operators in the field supports this conviction of the designing engineers...proves that the products of leading manufacturers stand up longer under the stress of exacting service.

It has been the privilege of INCO engineers and metallurgists to cooperate with the construction industry for many years. To men in all industries who desire assistance in the selection, abrication, and heat treatment of ferrous and non-ferrous alloys, the International Nickel Company cordially extends an offer of counsel and data.

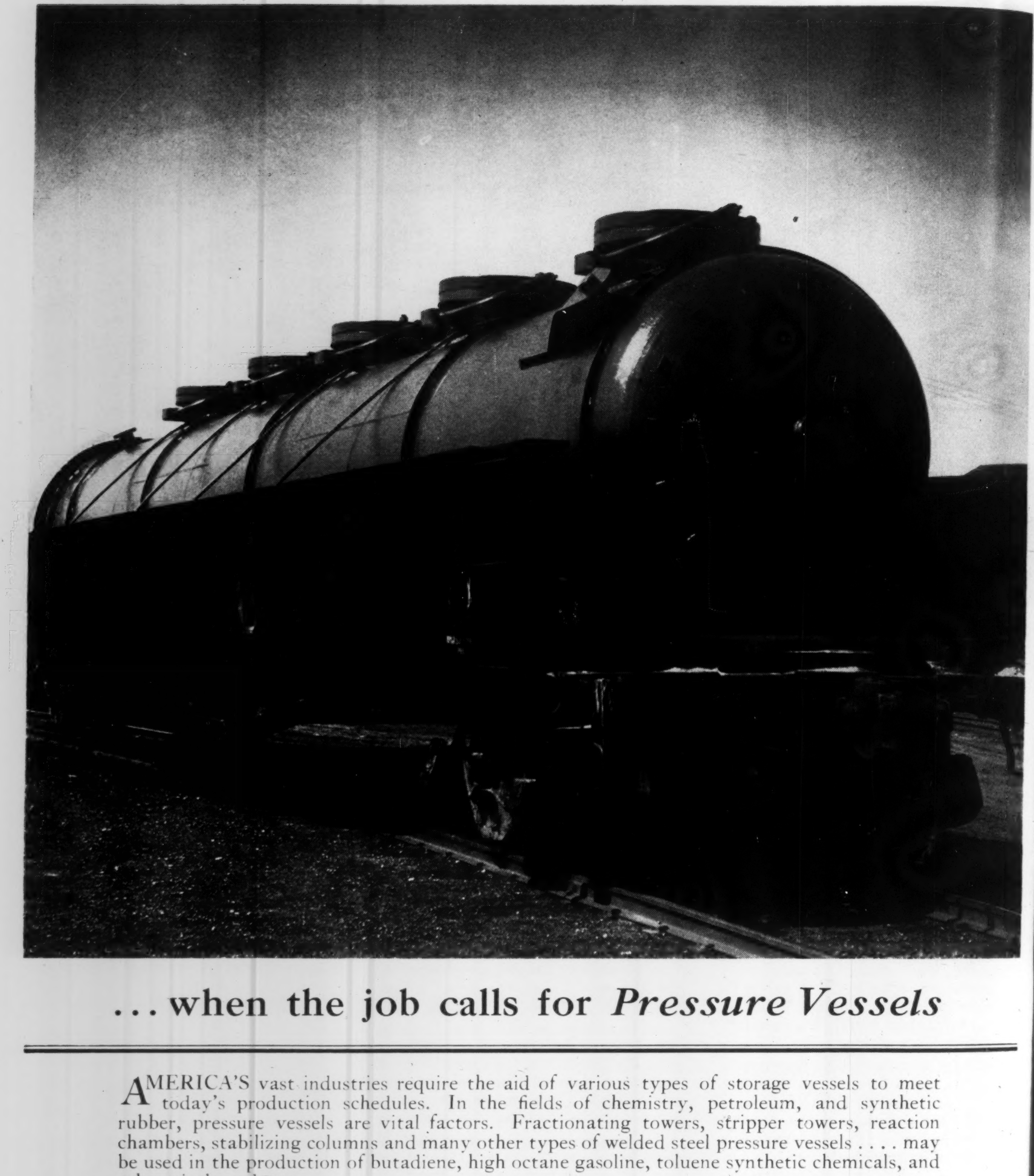
New Catalog Index

New Catalog C makes it easy for you to get Nickel literature. It gives you capsule synopses of booklets and bulletins on a wide variety of subjects—from industrial applications to metallurgical data and working instructions. Why not send for your copy of Catalog C today?



★ Nickel ★

THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall St., New York 5, N. Y.



... when the job calls for *Pressure Vessels*

AMERICA'S vast industries require the aid of various types of storage vessels to meet today's production schedules. In the fields of chemistry, petroleum, and synthetic rubber, pressure vessels are vital factors. Fractionating towers, stripper towers, reaction chambers, stabilizing columns and many other types of welded steel pressure vessels . . . . may be used in the production of butadiene, high octane gasoline, toluene synthetic chemicals, and other vital products.

The stripper tower shown was designed, fabricated and stress relieved at one of our plants for a specific job at a refinery. It measures 6 ft. in diameter and is 45½ ft. long.

We invite inquiries from today's leading industries.

CHICAGO BRIDGE & IRON COMPANY

Chicago 4.........2199 McCormick Bldg.
Cleveland 15........2263 Guildhall Bldg.
New York 6...3395—165 Broadway Bldg.
Philadelphia 3...1652–1700 Walnut Street
Havana...............402 Edificio Abreu
Houston 1............5628 Clinton Drive
Tulsa 3................1647 Hunt Bldg.
Birmingham 1........1596 N. 50th Street
San Francisco 5........1084 Rialto Bldg.

Plants in BIRMINGHAM, CHICAGO and GREENVILLE, PENNA. ***In CANADA—HORTON STEEL WORKS LIMITED, FORT ERIE, ONT.***

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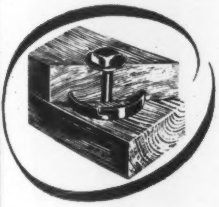
TYPICAL DESIGNS OF TIMBER STRUCTURES
TECO CONSULTING SERVICE

Structural Engineers and Architects—by the Thousands—are using these TECO SERVICES

Many leading companies and government agencies use Teco services. Upon request, Teco engineers have consulted with the engineers of the Army, Navy, and Maritime Commission, The Austin Company, Chas. T. Main, Inc., the Higgins Industries, Inc., and many others on the preparation of timber designs.

You, too, will find the Teco Consulting Service, Design Data Service, Typical Design Service and Research Service of great help in designing and building with timber. Teco distributors and fabricators in all parts of the country* can render helpful services, too.



TIMBER ENGINEERING COMPANY—Washington—Chicago—Minneapolis—Portland.

* Firms and addresses supplied on request.

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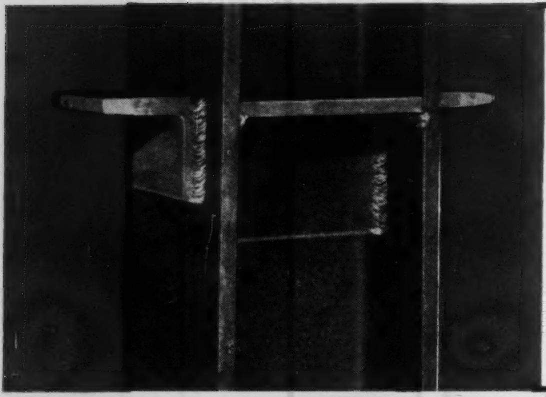
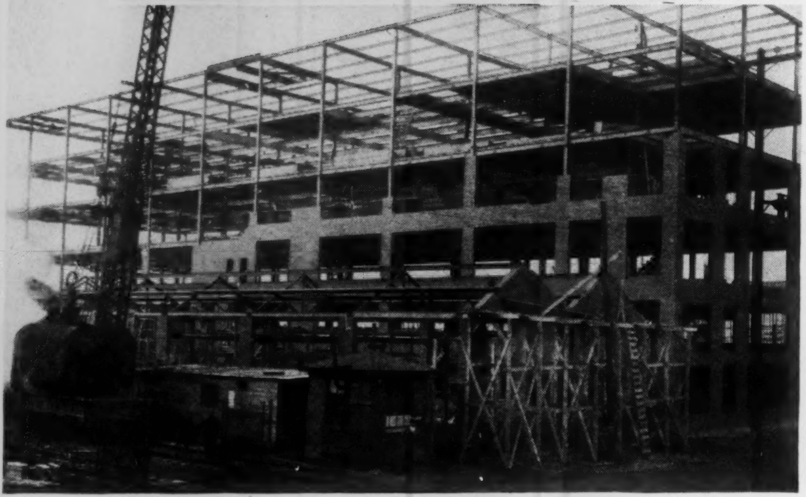
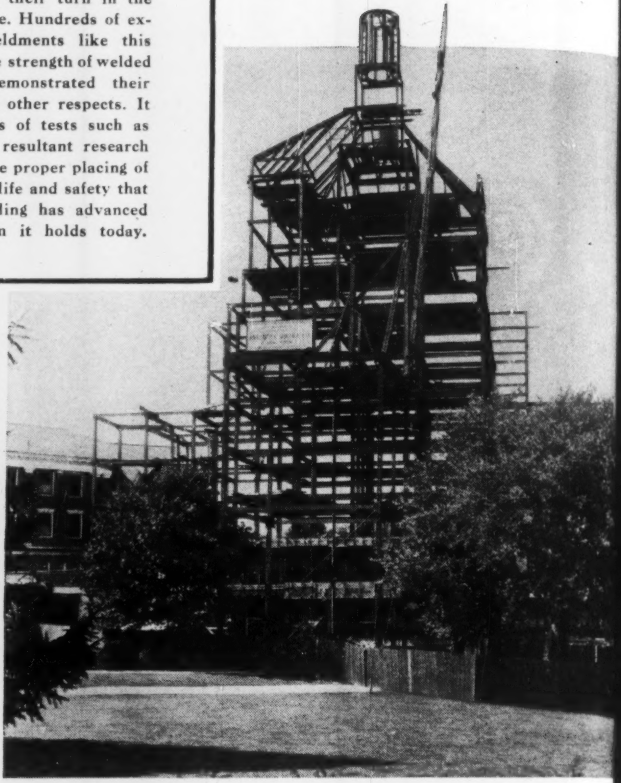


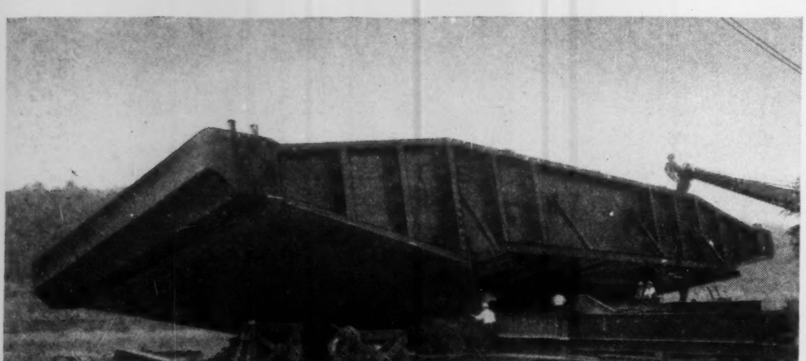
It started like this. Experimental beam seats of the "Twenties" awaiting their turn in the testing machine. Hundreds of experimental weldments like this determined the strength of welded joints and demonstrated their adaptability in other respects. It is on the basis of tests such as these and the resultant research and study of the proper placing of metal for long life and safety that structural welding has advanced to the position it holds today.



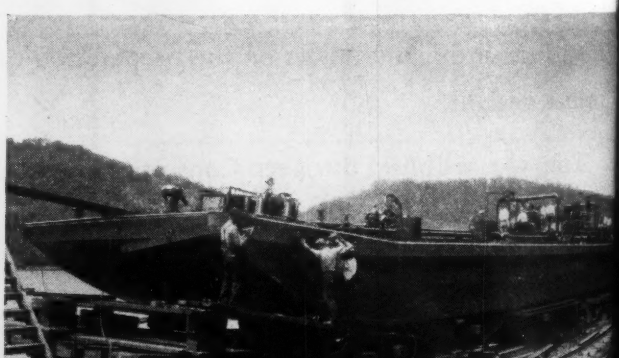
Forerunner of many to follow, this 5-story all-welded industrial building (equipped with welded crane runways, and embodying continuity in the framing of floor girders and joists), is typical of the structural welding that has found widespread application in hundreds of new plants. Structural welding in such applications has provided greater rigidity of structure and has resulted in real economy in the use of steel.



One of the first "towering" all-welded structures. An eleven-story addition to one of the country's notable hotels demonstrates another advantage of structural welding—quietness of erection. By eliminating the din and racket of field riveting, welding assured uninterrupted patronage of adjoining hotel quarters and no loss of revenue during construction.



This massive all-welded gate—equivalent in weight to a large industrial building—presented unusual difficulties from a welding point of view. The tolerances to which it had to be built were severely exacting, and to maintain close precision in such a ponderous assembly called for the utmost ingenuity and welding skill.



An all-welded barge for carrying bulk gasoline—one of the many now plying inland rivers which play an important role in relieving transportation bottlenecks. Welding has added speed to the production of these necessary parts of the shipbuilding program—saved thousands of pounds of badly needed steel.

in structural welding

IS OUR BACKGROUND FOR FUTURE SERVICE

STRUCTURAL welding has a comparatively short history—but it is crammed with accomplishment. From the simple experimental beam seat weldments of the early "Twenties" is a far cry indeed to the intricate completely welded LST's — Landing Ship, Tanks — that slide down our launching ways today. Nothing better illustrates the giant strides welding has made in speeding up, simplifying, and in reducing the weight of structural fabrication.

As one of the pioneers in the application of welding to fabricated steel structures, American Bridge Company has played a leading part in the research and experimentation on which today's methods and techniques are based.

The war has merely intensified and accelerated our activities. With increased production a paramount imperative, seconded by the vital need to conserve steel, structural welding, and our contribution to its successful application, has advanced by leaps and bounds.

In solving the problems of new and unusual welding applications, in developing new techniques to meet the special requirements of the war-time steels, in overcoming the difficulties presented by intricate and bulky weldments of exacting tolerances, American Bridge Company technicians and shop personnel have met every challenge.

Our welding facilities have been doubled and redoubled. Our technical research has been broadened. More efficient methods have been constantly developed. Shop forces have been intensively trained to new skills.

It is this wealth of technical knowledge and wide practical experience, supplemented by equipment and facilities second to none, that stands ready to help you in your post-war construction program. Welding will have a large part in it—and we know welding.

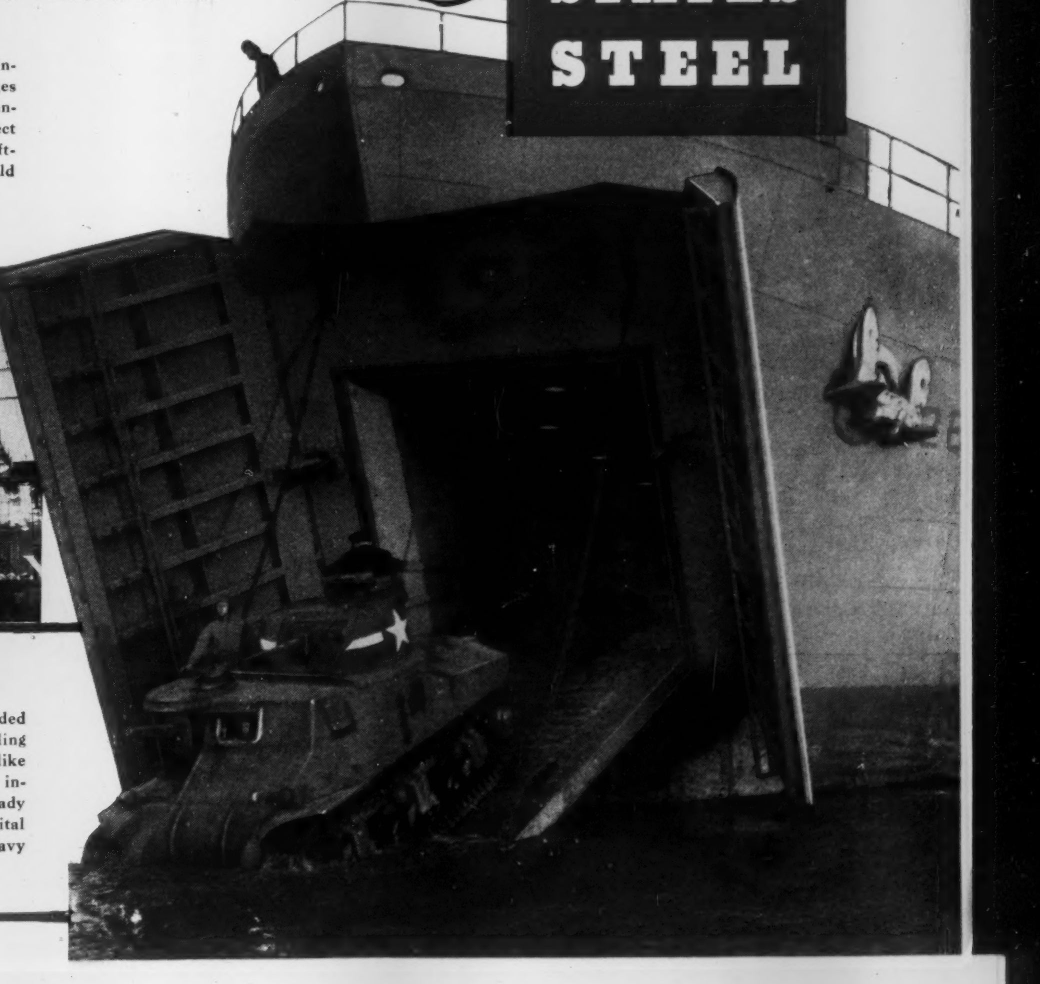
AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.
District Offices in: Baltimore · Boston · Chicago · Cincinnati · Cleveland
Denver · Detroit · Duluth · Minneapolis · New York · Philadelphia · St. Louis

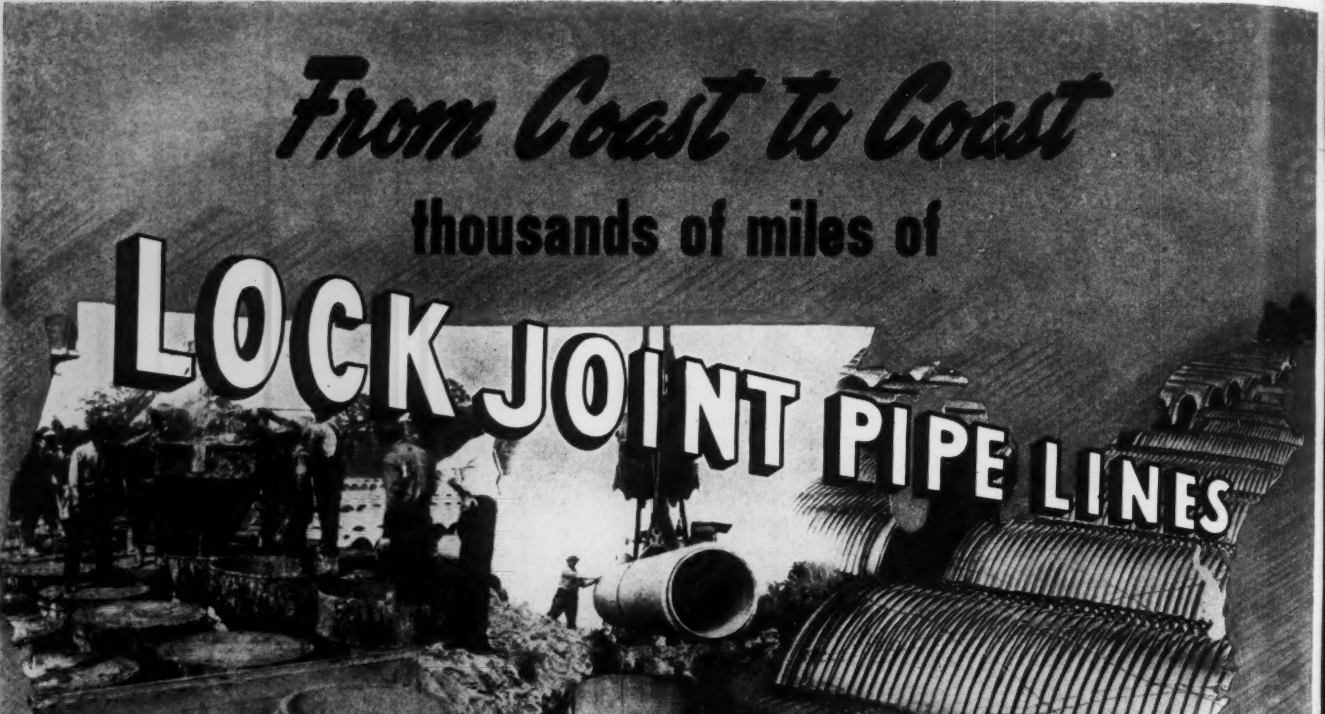
Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Export Company, New York

USS UNITED STATES STEEL

These all-welded machine frames for continuous rayon spinning units resulted in marked advantages and economies. These units required skilled workmanship of the highest order to assure rigidity and perfect alignment of hundreds of rotating reels, long line shafting and bevel gears in which it was necessary to hold tolerances to .001".
↓



And now — Landing Ship, Tanks
Born of American ingenuity, these all-welded "ugly ducklings" are one of the most startling types of ship the war has produced. Ships like this have been in production at one of our inland yards for many months. Many have already served their country well in establishing vital bridge-heads overseas. (Official U. S. Navy Photograph.)



From Portland, Maine to Oakland, California, Lock Joint Concrete Pressure Pipelines have created new high standards for water supply mains for the past 3 decades.

Leading water works engineers are definitely agreed that these highly efficient pipelines can absolutely be depended upon for strength, easy installation, adaptability, safety, high carrying capacity, water-tightness, long life and economical service.

In peacetime Lock Joint Pipelines are built with an eye to long-range programs and are recognized as the best method of constructing large diameter, high pressure water supply mains. In wartime, they offer a 25% to 75% saving of critical materials on 100% critical jobs.

The history of our many installations is the best proof of the lasting qualities built into every mile of Lock Joint Reinforced Concrete Pressure Pipe.

◆ ◆ ◆ ◆

Whether your project is large or small, for the present or the future, your 'phone call, telegram, cable or letter to any of our offices will bring a prompt reply.

LOCK JOINT PIPE COMPANY
Established 1905
AMPERE, NEW JERSEY

Denver, Colo. · Chicago, Ill. · Kenilworth, N. J. · Kansas City, Mo. · Rock Island, Ill.
White Plains, N. Y. · Valley Park, Mo. · Cleveland, Ohio · Hartford, Conn. · Navarre, Ohio

SCOPE OF SERVICES *Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply Mains as well as Concrete Pipe of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous lines.*

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

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A.W. FABER WINNER Techno-TONE MADE IN U.S.A. • 2H •

Why YOU will Prefer Techno-TONE LEAD

BECAUSE

1. It produces exceptionally opaque impressions which are ideal for clear blueprints.
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WINNER Techno-TONE is available in 17 scientifically graded tones—6B to 9H. Polished rich green. Made in U. S. A.

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FREE SAMPLE

Order WINNER Techno-TONE from your Dealer today. Or, if you prefer to try one with our compliments, we will gladly send you a free sample. Write to Dept. CE-12.

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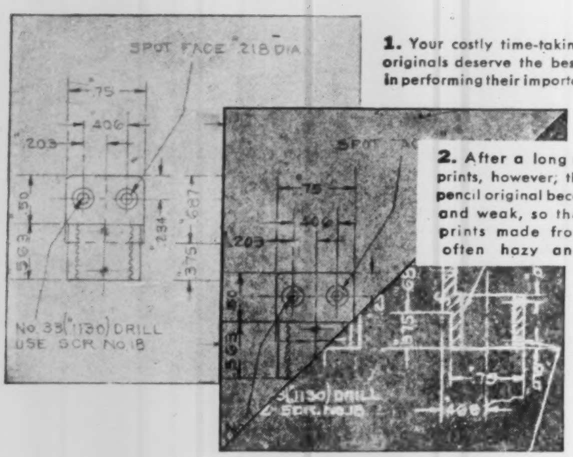
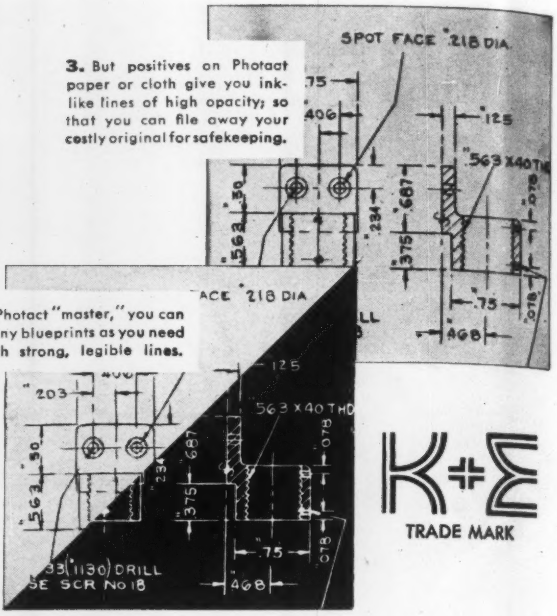


1. Your costly time-taking pencil originals deserve the best of help in performing their important tasks.

2. After a long run of blueprints, however, the lines on a pencil original become smudged and weak, so that the blueprints made from them are often hazy and illegible.



3. But positives on Photact paper or cloth give you ink-like lines of high opacity; so that you can file away your costly original for safekeeping.

4. With a Photact "master," you can make as many blueprints as you need—each with strong, legible lines.

K+E
TRADE MARK

STRONGER LINES
IN BLUEPRINTS
from pencil originals

Today's pressure for speed in product production requires increased quantities of highly legible blueprints, brownprints and black-line prints made from pencil drawings.

But pencil drawings, with all their advantages of speed and ease of correction, have a low opacity of line—and a tendency to smudge under frequent handling. As a result, blueprints from pencil originals generally do not have sufficiently strong lines for quick legibility.

Photact reproductions, on the other hand, have lines of high opacity which will not smudge or blur, so that large quantities of blueprints of consistent legibility can be made from Photact "masters."

For complete information about the Photact Process and Photact Papers and Cloths, write: Photact Dept., KEUFFEL & ESSER CO., Third & Adams Streets, Hoboken, N. J.

PRESERVES
RESTORES
DUPLICATES

PRESERVES: Photact *preserves* originals—the Photact print takes the place of the original as a "master" for reproduction and future reference.

RESTORES: Photact *restores* old, worn-out tracings—cracks, smudges, etc., can be easily eliminated from the negatives so they will not appear in the finished Photact prints.

DUPLICATES: Photact *duplicates* originals—as many "second" originals as may be needed can be reproduced from the negative on Photact tracing paper or cloth.

PHOTACT
TRADE MARK
Reproduction
PAPERS AND CLOTHS

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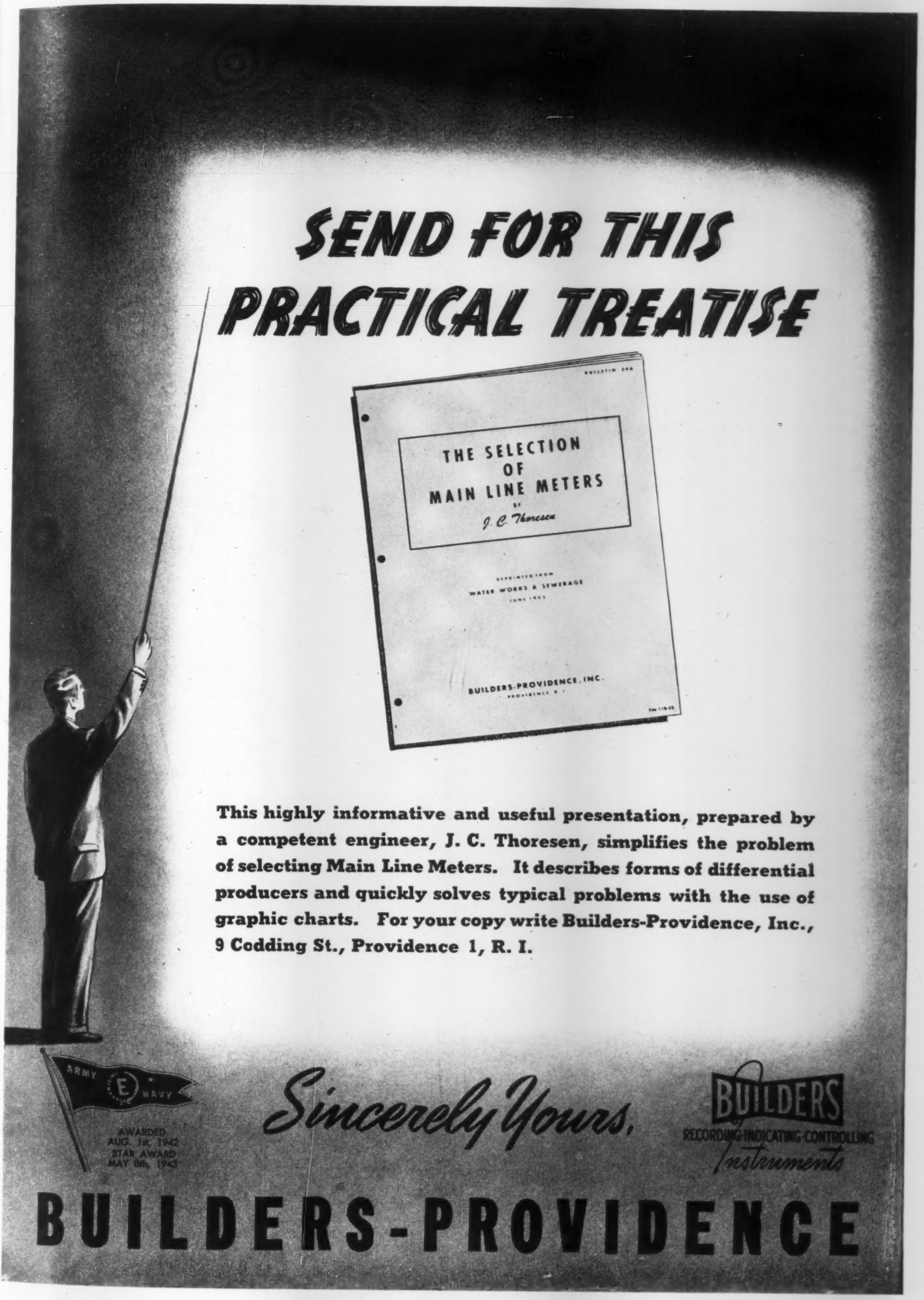
THE SELECTION OF MAIN LINE METERS
BY
J. C. Thoresen
WATER WORKS & SEWERAGE
BUILDERS-PROVIDENCE, INC.
ARMY E NAVY

SEND FOR THIS PRACTICAL TREATISE

This highly informative and useful presentation, prepared by a competent engineer, J. C. Thoresen, simplifies the problem of selecting Main Line Meters. It describes forms of differential producers and quickly solves typical problems with the use of graphic charts. For your copy write Builders-Providence, Inc., 9 Codding St., Providence 1, R. I.

AWARDED
AUG. 1st, 1942
STAR AWARD
MAY 8th, 1943

Sincerely Yours,

BUILDERS
RECORDING·INDICATING·CONTROLLING
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BECAUSE *"nothing else will do"*

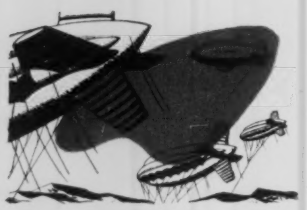
Even though *you* haven't been able to get it, you might suppose that aluminum paint has been supplied without question for Army and Navy uses. Not so! Before any aluminum pigment could be released, the WPB had to be convinced that no other paint would do the job.

The approved jobs have ranged from painting aircraft spark plugs for rust prevention to coating degaussing cables which protect ships from magnetic mines. Some of the uses are shown below.

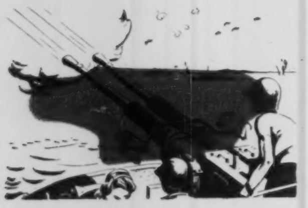
We wish we could show you the glowing testimonials written on the requests for authorization we get for releasing Alcoa Albron Pigment. The reasons given are all good reasons why, as it becomes available, you'll be using aluminum paint again.

WPB RELEASES ALUMINUM PAINT

A limited quantity of aluminum pigment, made from a war by-product, has been released for making aluminum paint "for industrial maintenance and essential civilian requirements". Get in touch with your paint supplier for details.

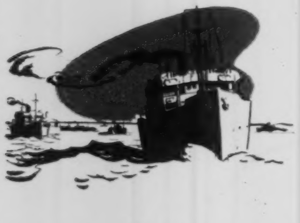


Barrage balloons for air raid defense, and blimps for submarine defense, are coated with aluminum paint to protect the fabric and reflect sun heat and, thus, reduce expansion and contraction of the gas inside.

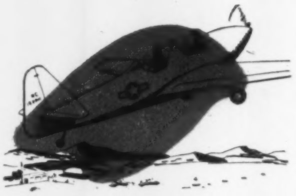


The Navy employs aluminum paint on ammunition boxes and magazines, gun control parts, target designators, gun sight lamps, spare parts boxes, and other purposes connected with gunnery.

Bombers and fighter planes have aluminum paint on motors, running lights, landing gear struts, wheels, ailerons, radio antennae parts, instrument panels and other places.



Warships and transport vessels use aluminum paint on heated surfaces of all kinds. Alcoa Albron Pigment is also used in a caulking compound to waterproof metal-to-metal joints.



The surface of plywood trainer planes is painted with aluminum paint to provide lasting protection and prevent raising of the wood grain. It resists moisture and the action of sunlight.

In field hospitals, aluminum paint is found on the interior of instrument sterilizers because it resists heat and moisture. It is also used to protect other surgical equipment.

In addition to the other applications mentioned on bombers and fighters, aluminum paint is used on floor sections, benches, radiators and other parts of the interior of giant troop transport planes.

There are many applications for aluminum paint on panels, chassis, cabinets, and tubes for radio and other electronic devices used by the Army Signal Corps and other armed services.

ALCOA
ALBRON

ALUMINUM COMPANY OF AMERICA

2131 GULF BUILDING, PITTSBURGH, PA.

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